IN THIS ISSUE: Reports of Del Monte and Pasadena Conventions

JOURNAL OF ELECTRICITY

VOL. 44 NO. 11 SAN FRANCISCO, JUNE 1, 1920 PER COPY, 25 CENTS

Steady Repetition

THE report of this installation of a single Wagner Motor is but representative of the repeated commendation of our customers. As will be noted, the Wagner Motor is directly connected to a centrifugal pump forcing 125 gallons of water per minute against a head of 15 feet.

Working day in, day out, 8 to 10 hours per day, 6 days a week—*without repairs or special attention of any kind*—and requiring only a new set of bearings after fourteen years of almost continuous operation—such is the heritage of Wagner Motors.

The letter tells the complete story repetition of what thousands of small and large motor users have told—the story of Wagner, Quality.

If you have alternating current motor-drive problems, let us tell you more about Wagner, Quality.

AMHERST COLLEGE
AMHERST, MASSACHUSETTS
OFFICE OF THE TREASURER

H. M. Kingsley, Treasurer

September 12th 1919

Wagner Electric Mfg. Co.,
88 Brookline Ave.,
Boston, Mass.

Gentlemen

In the matter of the bronze bearings: Please send us a complete set of bronze bearings with oil rings, for type "1-B", 2 H.P. This motor has been in continuous service since about 1905. It pumps water at the rate of 125 gallons a minute against a head of about 15 ft. It is required to work from 8 to 10 hours six days in the week almost steadily through the year and sometimes it has to work on Sunday. So far as I can now recall, this is the first repair we have ever had to make on it.

Yours very truly,
H. M. Kingsley
Treasurer

CHARTER 1920

Wagner Electric Manufacturing Company, St. Louis

Lillibridge 61-B363

The FEY AUTOMATIC GRIP HICKEY

"STICKS WHERE IT GRIPS"

Bends Pipe Quickly

No Kinking—No Breaking—No Flattening

COMPLETE INFORMATION
FURNISHED ON REQUEST

BULLEN & COMPANY

1508 Claus Spreckels Bldg. San Francisco, Calif.

JOURNAL OF ELECTRICITY

FOUNDED 1887

ROBERT SIBLEY, Editor

VOLUME 44 | SAN FRANCISCO, JUNE 1, 1920 | NUMBER 11

Contents

EDITORIALS 541

Echoes of the Convention—Greatest Electrical Gathering Ever Held in the West—The Pacific Coast Section, N. E. L. A.—Constructive Utility Regulation—S. M. Kennedy: A Tribute—A Sales Policy Plan—Registration and the Convention Daily—Buying Associations—A Year of Significant Achievement—Group Financing—Large Furnaces for Fuel Oil Burning.

THE N. E. L. A. CONVENTION AT PASADENA 545

A summary of the business sessions and social activities of the Pasadena Convention of the National Electric Light Association, including several pictures of convention delegates.

ELECTRICAL SUPPLY JOBBERS' DEL MONTE CONVENTION 550

A brief report of the convention of the National Electrical Supply Jobbers' Association which includes Tournament results and a group picture of those present.

THE PACIFIC COAST SECTION, N. E. L. A. CONVENTION 553

A complete report of the convention of the Pacific Coast Section of the National Electric Light Association which was held at Pasadena just preceding the national convention. The outstanding points of discussions and reports are brought out.

SAN FRANCISCO'S ELECTRICAL HOME 560

Description and illustrations of the perfectly equipped electrical home which is being furnished through the efforts of the California Electrical Cooperative Campaign and various San Francisco business houses.

CO-OPERATION WITH ARCHITECTS AND BUILDERS — by H. F. Jackson 561

A paper which sets forth the desirability of the electrical man cooperating with the architect and home builder so that new homes will be properly equipped with convenience outlets.

CO-OPERATION IN THE ELECTRICAL INDUSTRY 564

An extract from the report of the N. E. L. A. Committee on Cooperation which was presented at the Pasadena convention. The various organizations for cooperation in the industry are mentioned and the work of the California Electrical Cooperative Campaign is given in detail.

ELECTRICITY IN PIERCE COUNTY COAL MINES — by E. J. Barry 565

A review of the complete electrification of a northwestern coal mine and its influence upon the surrounding properties.

A NEW THEORY OF MATTER — by Dr. A. C. Crehore 568

A discussion of the electron revolving in a circular orbit and of the mechanical forces which result.

A Garden Creation at the Convention—Frontispiece 539
Reduction of Fires in Generating Units 562
Office Records—Their Filing and Indexing — by Irene Warren 563
Sparks 572
Personals 573
Meeting Notices for Electrical Men 576
Happenings in the Industry 579
Latest Electrical Developments 586
Vacuum Cleaner 588

PUBLISHED SEMI MONTHLY BY THE

TECHNICAL PUBLISHING COMPANY, Rialto Building, SAN FRANCISCO, CAL.

WILLIS M. DEMING, President & General Mgr.
ROBERT SIBLEY, Vice-President & Editor
ARTHUR H. HALLORAN, Secretary

NEW YORK, Tenth Ave. at 36th St.
WASHINGTON, D. C., 610-611 Colorado Bldg.
CHICAGO, 1570 Old Colony Building
PHILADELPHIA, Real Estate Trust Building
ST. LOUIS, 718 Star Building
CLEVELAND, Leader-News Building
SAN FRANCISCO, Rialto Building
LONDON, E. C., 6 Bouverie St.
BUENOS AIRES, Calle Corrientes, 685

OWNED BY McGRAW-HILL COMPANY, INC.
Publishers of
American Machinist
Electric Railway Journal
Engineering and Mining Journal
Power
Coal Age
Chemical and Metallurgical Engineering
Engineering News-Record
Ingenieria Internacional
and of
THE ELECTRICAL TRIO:
ELECTRICAL WORLD —— JOURNAL OF ELECTRICITY —— ELECTRICAL MERCHANDISING

Copyright, 1920, by Technical Publishing Co., Inc. Issued on the 1st and 15th of each month. Entered as second-class matter Jan. 1, 1917, at the Post Office at San Francisco, under the Act of March 3, 1879. Subscription Rates in United States, Mexico, Cuba, Porto Rico, Hawaii and Philippines, $2.50 per year. Canada, $3.25. Elsewhere, $4. Single copy, 25c. When change of address is required, both old and new addresses must be given. Notice must be received two weeks before change takes place.

Member Audit Bureau of Circulation

Index to Advertisers—page 28 Where to Buy in the West—pages 29-33

—Copyright Western Electric Co.

OUT from this garden creation at the great Convention of the National Electric Light Association at Pasadena came a thousand wonders of exquisite beauty. As electricity made possible this wonderful scenic effect, so will it make possible an ever increasing beauty and progress in human affairs for years to come, as a result of the magnificent papers and discussions accumulated at the convention sessions, the enthusiasm instilled in those in attendance, and the vision of possibilities of helpfulness to mankind with which all felt imbued as they left the Convention hall at Hotel Huntington, May 22, 1920.

JUN 10 1920 ©CLB461893

JOURNAL OF ELECTRICITY

DEVOTED TO THE UPBUILDING OF THE ELECTRICAL INDUSTRY IN THE WEST AND IN THE COUNTRIES BORDERING THE GREAT PACIFIC

Volume 44 SAN FRANCISCO, JUNE 1, 1920 Number 11

(Copyright, 1920, by Technical Publishing Company)

ECHOES OF THE CONVENTIONS

NEVER before in the history of the West have three gatherings proven of such unusual helpfulness as have those of the month just closed. So many and so varied were the splendid ideas brought out in formal and informal discussion in the convention halls, and upon the vast highways of California where convention delegates went to see what we had to offer in the West, that it is difficult indeed in a few words to give an adequate idea of the great good resulting from these gatherings. The outstanding features of these three conventions is the evident desire on the part of the men of the electrical industry to maintain sincerely the highest ethical standards in service to the nation, to sense the needs of industry, and to supply these needs at a reasonable return for such service, thereby bringing about the fullest and best development.

In actual discussion the outstanding features proved to be that railway electrification in the march of progress is an assured fact; that the financial return for service is secure when a utility is earnestly and steadfastly endeavoring to render to the public the highest type of service; and finally, that the vast water powers of the nation must be unloosed, and that the problem of financing will be solved through the cooperation of a sympathetic public, reasonable in its attitude, and fully appreciative of the unlimited possibilities of good to industry that may be brought about through the self-interest idea when the water powers of the nation are fully developed.

By reason of these outstanding features, 1920 will go down in history as the most eventful in all the years of the electrical industry—the year of the meeting in the West of the National Electrical Supply Jobbers' Association, the Pacific Coast Section N. E. L. A., and finally the National Electric Light Association, the master convention in this year of years in conventions electrical.

Greatest Electrical Gathering Ever Held in the West

It is difficult to fully appraise the far-reaching effect that will be felt, not only by the electrical industry, but in every phase of industrial and civic development of the nation, as a result of the wonderful gathering that has just completed its sessions in Pasadena. Coming at a period in our national development when the industry is shaken to its innermost, and people generally are uncertain as to the future, the authoritative data on water power, the new vision of utility regulation sponsored by two of our foremost regulating commissioners, the promulgation of ideas and practical idealism in utility service by one of our best known authorities, the presentation of statistical data on electrification of steam railways, the pronouncement of public policy visualized by John A. Britton, dean of our industry, the setting forth of cooperative ideals that go toward making a better and more useful industry, and the magnificent setting of a convention in a country teeming with possibilities and accomplishments—all these things will go down in history, making a record of the National Electric Light Association Convention in Pasadena as the greatest and most helpful of its kind ever known in the history of our industry.

It is difficult to thank individually all those who had a part in this wonderful work at Pasadena, but to R. H. Ballard, the fountain head, who so earnestly, faithfully, and constructively worked during the past year for its accomplishment, the nation at large must ever owe a debt of gratitude.

The Pacific Coast Section N. E. L. A.

While the labors of the Pacific Coast Section, N. E. L. A., insofar as convention activities are concerned, were subordinated to the greater and bigger task, that of making a successful national gathering of the Association in Pasadena, yet there will remain in the minds and hearts of those present at the recent Pasadena convention a lasting impression of the wonderful year of accomplishment that this Pacific Coast Section, N. E. L. A. has recorded. Pre-eminently, and above all else, will go down into history two outstanding features, the one the crystallization of the geographic

section idea as a national unit in Association efforts, and the other, that the self-interest appeal is the only sane and secure method whereby vast sums of money for utility finance may be acquired in the future life of the industry. To the establishment of these two ideals in the industry the Pacific Coast, and indeed the industry at large, will ever feel indebted to A. Emory Wishon, president of the Association, who so ably fulfilled the duties incumbent upon him during the past year.

Constructive Utility Regulation

In this day of financial uncertainty and the demand for vast sums of money to be invested in the electrical utilities throughout the nation, the addresses of E. O. Edgerton, president of the California Railroad Commission, and of Carl Jackson, president of the Wisconsin Railroad Commission, given before the recent Pasadena Convention of the National Electric Light Association, will long linger in the minds of those who heard them, and for years to come they will undoubtedly serve as the basis upon which constructive regulation must be built in order to make possible the fullest development of our industry. A profound impression will be created in the industry throughout the nation when full realization is given to the fact that Mr. Edgerton deduces all his logical conclusions from the premise that it is to the interest of the consumer and to the public at large that the great electrical utility institutions of our nation be kept financially sound. Fully admitting that the financier needs inducement to invest his funds in these securities, he forcefully brings out the point, however, that no such inducement as would call forth exorbitant or unreasonable rates could ever be approved by a regulatory body. But the thing that made a profound impression upon all was that he considers assets of a utility as consisting not alone in physical units of power houses and transmission lines, but greatest of all, that electrical energy itself constitutes a vital and essential service to the people, and as a consequence presents the most lasting and enduring asset that can possibly be offered for any security.

S. M. Kennedy—a Tribute

In the last issue of the Journal of Electricity was concluded a series of articles under the authorship of S. M. Kennedy on the subject of Public Relations. These articles have created such a profound impression, not only throughout the industry in the West, but throughout the nation, that we should feel we had failed in our duty unless at this time we expressed not only the appreciation and gratification of the Journal of Electricity for this able work of Mr. Kennedy, but also the appreciation of men of the industry in all parts of the country. Mr. Kennedy, perhaps to a degree equaled by no other living individual, possesses the ability to sense the need for service, to visualize this need and then to put it into words so that the executives, the employes and the man in the street may gather a clearer and more inspiring vision of the great need for service in this present generation. It will, as a consequence, come as good news to men of the industry everywhere to learn that at an early date the entire series of articles by Mr. Kennedy—which includes the twelve articles that have appeared in the Journal of Electricity; the "Man in the Street," which made such a profound impression at last year's convention of the Pacific Coast Section N. E. L. A.; and the wonderful contribution he has made to the proceedings of the recent convention of the National Electric Light Association at Pasadena on the subject of Service,—will appear in bound form. From indications received from many regulating commissions, from public utilities and from men of the industry throughout the nation, we believe that this work of Mr. Kennedy's will become a classic authority on public relations.

That Mr. Kenendy's paper at Pasadena should have received the rousing response from the convention that it was accorded, and that Commissioner Edgerton in his address which immediately followed Mr. Kennedy's paper alluded to it as the basis upon which utility service should be built, came as no surprise to those who have followed his writings.

A Sales Policy Plan

One of the striking features brought out at the recent Electrical Supply Jobbers' Convention at Del Monte was the marked emphasis placed upon the necessity for business houses having a definite sales policy in business organization. E. W. Rockafellow of the Western Electric Company even went so far as to state that, though such policy be in error, it is far better than no policy at all, for at least it gives a basis upon which the business world may work.

Too often in the past the various organizations in our industry, by hit-and-miss pronouncement of policy, have created uncertainties and vague ideas of business responsibility throughout the country. We commend in the highest terms the effort of Mr. Rockafellow in his endeavor to impress his hearers with the necessity of the institution of sales policy.

Registration and the Convention Daily

From every quarter congratulations have poured into the offices of the Journal of Electricity over its part in getting out the convention dailies entitled "The Roundup," "Council Fires" and "Western Gold," which were dedicated to the recent convention by the McGraw-Hill Electrical Trio—Electrical World, Electrical Merchandising and the Journal of Electricity.

Perhaps the question of accurate registration lists has been a subject of more comment than any other in calling forth congratulations. There was in attendance at the convention a record-breaking enrollment, the complete list of names totaling practically 2,500. Of this list, the complete enrollment of men was shown in the first issue; in the second issue, where confusion ordinarily begins, only three omissions of addresses were shown; while in the third, of the total enrollment given under the most confusing situation, but twenty-two names showed incomplete address registration.

The Journal of Electricity wishes to take this occasion to thank all those who so kindly and cheerfully helped us in this work, and we are sure that our two companion papers, Electrical World and Electrical Merchandising, join us in this thanks to the industry for their hearty cooperation.

Buying Associations

Throughout the state of California and other districts of the West there is a movement growing which might be called Development of Cooperative Buying Associations. This is particularly active among the farmers. We find such in the Ukiah Farmers Club, the Fruit Growers Supply Company and the Orange Growers Association. Some of these associations have quite far-reaching activities; some have actually gone into manufacturing.

One of the objects of these associations is to employ their collective buying power to the benefit of the individual member. This means that the associations' buying power is employed to secure large-buyers' discounts for the benefit of the individual small-buyer, only a very small percentage being charged to the individual for the cost of handling the negotiation.

In the case of motors, the associations have been asking the electrical manufacturers for motor agency agreements which give them discounts of 15 and 5%. The association keeps the 5% discount and turns the goods over to the individual farmer at a price equivalent to 15% discount; whereas the individual going into the open market would have to pay net retail.

There is no doubt but that these associations get the goods cheaper for the farmer than he otherwise would get them, but the buying of electrical goods does not stop there. Motors, for instance, must be installed and wired up; they must be properly protected from overloads and under-voltage; they must be put in to comply with fire and safety laws. In the case of trouble some electrical man has to be depended upon to give service.

When a manufacturer is successful in making an agreement with one of these buying associations, there is no doubt but that the manufacturer gets a very nice volume of business at relatively low expense. But in consideration of the support which we all are giving to the California Electrical Cooperative Campaign and to the work of the jobber and contractor-dealer associations, it seems rather inconsistent for us to encourage and foster the further development of these cooperative buying associations, unless every ethical standard and quality of service be rendered to the industry by these associations that is now so prevalent in all the various branches of the electrical industry throughout the West.

The electrical dealer and contractor particularly should be afforded every possible opportunity to handle all the electrical business that goes into his territory. Therefore inasmuch as the farmer ultimately has to call in the electrical contractor and dealer to install his motor, wire it up, provide it with protective devices, and see that it meets the fire and safety laws, it seems only right that everything should be done to discourage the cooperative buying associations from handling electrical goods. On the other hand, we should do everything possible in the industry to stand together and encourage the farmer to buy through his local electrical man.

In the final analysis this means that adequate and proper electrical goods will be sold to the farmer. He will get what is most needed by him rather than what he thinks he may want. He will get the goods at a fair price, properly installed mechanically and according to the law, and in the end this will not cost him any more money than he otherwise might pay.

The electrical manufacturers can of course do much to help this situation in not offering these buying associations preferred discounts. On the other hand the electrical contractor and dealer must sell to the farmer the idea that he has a service to render which is worthy of the farmer's consideration in the first cost.

A Year of Significant Achievement

With this Echo Issue of the Journal of Electricity ends a fiscal year of activity for 1919-1920. Powerful issues of the Journal that have been sent forth to the industry during the past two months, particularly our convention issue of May 15th, 1920, have won commendation and appreciation from every nook and corner of the nation. It is fitting then to review briefly the activities of the Journal of Electricity during the past year.

Serial articles such as those by S. M. Kennedy on public relations and by Dr. A. C. Crehore on the New Physics have taken the Journal of Electricity into commercial departments of the central station on the one hand and into scientific and engineering thought on the other to an extent which has surpassed our fondest expectations. In the matter of hydroelectric practice and fuel oil and steam engineering the Journal has continued to evoke interest from all parts of the world where these matters are of importance.

Our courses through the university extension division of the University of California have been followed far and near, and we feel no small sense of pride in the fact that both the students in these courses and the university authorities themselves have expressed their appreciation of the helpfulness of the Journal of Electricity in spreading the educative idea.

Our chronicling of Builders of the West has set, in the written record of leaders of the day, new standards in ideals for generations to come. Our news columns and personals have a certain sense of "home" that has won over the hearts of Western readers by the thousands, and have today secured for the Journal of Electricity a warm place in the heart of the electrical industry west of the Rockies. And yet, this is only a beginning; the next year must see us go forward to new planes of achievement. Already our plans are being laid for accounting

courses with the University of California, for studies in water power research, for investigations of new and unusual uses of electrical energy and for effective aid to the contractor-dealer in his merchandising efforts throughout the West. Coupled with this we shall continue to have technical and scientific articles of high value, and thus we shall extend the influence already held in the scientific and engineering world by the Journal of Electricity. And above all, the editorial force and power of the Journal will be broadened. Its opinion is even now sought by regulating bodies, executives of power companies and others in authority. With its sincerity of purpose, the Journal of Electricity has ever gone about its task of helpfulness to the industry, and it pledges itself to this same conscientious endeavor in the future, for due to this sincerity of purpose alone we credit the splendid stand its editorial pen holds in the community at large today.

Group Financing

In a recent issue of the Journal of Electricity attention was called to the advantages which might be gained by group-action in financing.

The public is quite familiar with group action as taken in the past, particularly with reference to merchandising those products which are produced by a number of persons or firms engaged in the same field. These group actions have proven very satisfactory, both from the viewpoint of the producer and from that of the consuming public. The public gain the advantage of a product of the reliability of which they feel assured as it is backed by the resources and good-will of a large group, mutually interdependent for their continued prosperity. The producer gains in that his product is accepted with less question, coming as it does with the reputation of the group behind it. His products are placed on a par with all the others of the group, and in his campaign he is able to avail himself of the counsel of the most competent advisers.

The power companies of the West, and of California particularly, would do well to make use of some of these lessons. For years ahead it will be necessary for companies in California to seek $50,000,000 per annum of new capital for extensions and investments. Inasmuch as they exist and operate under similar conditions, the matter of their financing might well be done by group action. Each company generates power by water; transmits it over long high voltage transmission lines; serves the same general character of consumers; receives approximately the same rates; is regulated by one commission which has adopted the attitude of allowing a reasonable return upon the investment and issued securities, and each investment per kilowatt capacity is the same within reasonable bounds.

Of course, the ultimate of group financing is a merger of the corporations or the formation of a holding company which would underwrite the securities of the corporations in the district. The latter might prove most feasible in that the companies would not wish to lose their corporate identity. Through the underwriting of the securities of the district by one large responsible concern, the public would gain the information, and that correctly, that the prosperity of one company was the prosperity of another and that the resources behind one issue of securities was the combined resources of all of the companies in the group. By the adoption of some such plan it is believed that one of the great difficulties ahead in the question of finance will be eliminated.

Large Furnaces for Fuel Oil Burning

In order to operate oil burning boilers at high capacity, it is necessary to provide ample furnace volume. With the usual type of steam atomizing burner it is possible to burn as high as six or seven pounds of oil per hour per cubic foot of furnace volume, but for the best efficiency the quantity should not exceed three or four pounds per hour per cubic foot. There are two ways by which the furnace volume can be increased; one by lengthening the furnace and the other by raising the boiler. As an instance of this let us take one of the common types of boiler, such as the Babcock & Wilcox design. In this particular design, a larger furnace can also be obtained by moving the bridge wall back to the mud drum and placing the burner there. This gives the furnace the full length of the tube, the bottom tubes being covered with tile from the rear headers to the front baffle to prevent the gases by-passing direct to the third pass of the boiler. In other types of furnace, such as the Hammel, increased volume is obtained by raising the boiler a few feet higher than the standard height.

With such excessive demand for increased boiler capacity and the inability of manufacturers to supply new boiler equipment within reasonable time limits, the subject of increasing the furnace capacity is one of vital and timely moment, and, as a consequence, engineers may well give some thought and consideration to present installations, and to methods by which furnace volume may be increased with the least expenditure possible.

JUNE 15th---SPECIAL FOREIGN TRADE ISSUE

Report of the Seventh National Foreign Trade Convention

Power Developments in the Orient in connection with Mining Projects
The Fluctuating Dollar and Foreign Trade
Railroad Electrification in South America
Power Development in Scandinavia

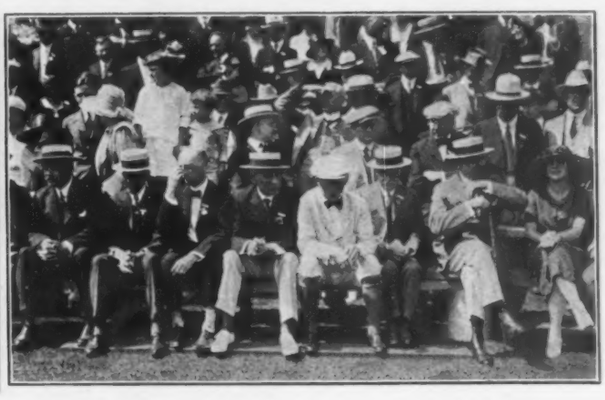
Pasadena Convention, N. E. L. A.

(Twenty-five hundred men from every section of the nation and from every branch of the electrical industry gathered in Pasadena for the five days, May 18-22, to attend the 1920 convention of the National Electric Light Association. The data presented there on national water power, railway electrification and advance in ideals of cooperation, public utility service and commission regulation, has made the convention an event of widespread and lasting inspiration for the entire industry.—The Editor.)

Unquestionably the electrical industry will be stirred from east to west and from north to south in its national life due to the splendid work of the recent convention of the National Electric Light Association at Pasadena. Many prophesied it would be a successful afiair, but few dreamed that such powerful data on water power statistics, railway electrification, cooperation in the industry, new advances in commission regulation, and new ideals in utility service would be brought out to such a marked degree. It is difficult to fully recount the names of those who had a constructive part in this work, for such team-work characterized the convention in its preparation from start to finish. It would seem unfitting, however, to pass by unspoken the names of C. H. Peirson, in publicity efforts; K. E. Van Kuran, in ladies' entertainment; A. E. Wishon, having in charge Pacific Coast Section night; A. B. Wollaber, who did such splendid work on the hotel committee; W. L. Frost, who was at all times, together with his good wife, in the foremost ranks in planning entertainment features; S. M. Kennedy, whose masterly hand in program arrangement was observable on all sides; A. E. Morphy and John B. Miller in general convention committee activities, one of which was the wonderful reception at the Miller home where Mr. and Mrs. Miller proved such charming host and hostess; to M. H. Aylesworth for his dispatch in executive detail; and, finally, to R. H. Ballard, the wonderful organizer and genius of the past year in N. E. L. A. activities. All these men have won an enduring and lasting debt of gratitude from the industry at large and to them the Journal of Electricity would extend with men of the industry in the West their heartfelt and cordial appreciation.

The keynote of the convention, aside from the wonderful ideals and cooperative helpfulness which permeated every activity and every ideal expressed was the question of financing, and so ably and so well did Commissioner Jackson, president of the Wisconsin Commission, and Commissioner Edgerton, president of the California Commission, express their views on utility problems of the day that men of the industry have taken new hope, and it may truly be said that the outcome of this great convention will be a sound optimism for utility finance for the future, all of which may be well summed up in the words of S. Z. Mitchell, president of the Electric Bond and Share Company of New York City, who, having heard throughout, the discussions and addresses of Mr. Edgerton and Mr. Jackson, impressively spoke as follows:

"Mr. Chairman: I have been greatly impressed with the analysis of the situation as set forth in the remarkable papers read by Mr. Jackson and Mr. Edgerton at this meeting. During the past few years I have been discouraged at times over the final outcome of public regulation because under it such a large number of public utilities have been facing slow death through starvation. This has been due no doubt, in a few cases, to politics, but principally to a lack of appreciation—particularly on the part of the newer commissions—of the difficulties involved in the practical operation of utilities. The papers read here by Mr. Jackson and Mr. Edgerton give us new hope and are most encouraging. They show conclusively that these gentlemen are fully informed as to the difficult problems from both the public and the company's standpoint and that they have accurate and positive views as to the procedure which is necessary to get best results in the public interest. This means for the best interest of the companies as well, because under proper regulation everything that is for the public interest must of necessity be for the company's interest. The greatest, and in fact the principal difficulties in the way of public service progress today are due to antiquated and unworkable laws which do not fit modern conditions and also that lack of elasticity and quick responsiveness to rapidly changing costs of everything, including money, which has caused the public to lose confidence in a large measure in the stability and safety of public utility investments. If the practical suggestions made here by these men are adopted and made effective by all the regulatory commissions there will be an astonishing re-establishment of public confidence and favor for utility investments. This will mean that utilities can obtain, under normal conditions, much larger amounts of capital than has ever heretofore been possible and at much lower rates than under the present conditions. This will mean a saving to the people of a sum which, capitalized at 6%, will amount to much in excess of one billion



In case you could not pick out your friends in the big group picture, try these two sections, snapped by our photographer while they were waiting for the panorama camera-man to say, "All still, please."

N. E. L. A. CONVENTION DELEGATES AT THE HOTEL HUNTINGTON, PASADENA.

dollars. This is of great public interest and is especially important in view of the imminent passage by Congress of the water power bill and the enormous demand to follow for additional capital in order to conserve coal and oil and the labor and transportation charges incident to the use of same. I feel that every citizen is indebted to these gentlemen for their clear enunciation of the correct principles involved in utility regulation."

BUSINESS SESSIONS

With the electrical industry standing at the threshold of a new era of development following the upheaval of the war, the recent convention of the National Electric Light Association was one of especial significance in the importance of the problems discussed and the decisions arrived at. The problem of financing the extensive construction needed to meet the requirements of the nation, the coming question of railway electrification and the development of our water powers which will be opened up by congressional legislation, as well as increased activity in association affairs through the growth of the geographic section idea were matters which were ably discussed and upon which action was taken which shall have a far-reaching significance in the developments of the coming year.

The convention was opened by Governor Wm. D. Stephens, who offered the hospitality of California and expressed the appreciation on the part of governing bodies of the importance of the electrical industry to the West.

The President's Address

The keynote of the convention was sounded in the forceful report of President Ballard, whose recommendations in detail were approved and commended to the attention of the organization by the committee reporting at the last session. Brief extracts from this report are here given:

Financial Situation —

The industry needs approximately $750,000,000 of new capital right now to care for the expanded requirements of the country, and the ability of the utilities to raise this large sum of money hinges on the earning power of the investment, the economic soundness of proposed developments, support of public utility commissions, favorable opinion of the public at large and the extent to which our securities are forced to compete for favor in the general money market.

Public Ownership —

The kind of public ownership which brings results is ownership by the public at large in the stocks and bonds of their local regulated utility companies. This forms a partnership which leads to complete understanding and cooperative effort in development and retains in the management and operation of the utilities those trained by long experience to perform the task.

Interconnection of Generating Systems —

The economic growth of the electric utility business lies in larger and more efficient units of production and in their interconnection. Not only does interconnection make for greater reliability and adequacy of service, but it saves fuel and labor, conserves capital and plant investment and improves load factor; thereby reducing the cost of the unit of measurement, which is advantageous alike to the consumer and the utility.

Railroad Electrification —

Trunk line electrification has its greatest argument in the future, for with the rapidly increasing cost of fuel and traffic, the ultimate return on any amount now invested in electrification will be more than generous compared with the return on the accumulated amount which might be spent over a long period in patching up the systems. Aside from the greater comfort in travel and the purely operating economies obtainable, enormous savings in coal are possible through electrical operation of the railroads. The central station industry is vitally concerned in such a transformation of our railroad systems, because to it the railroads look for their power supply.

Water Power Development —

For over 10 years efforts have been made to get the great hydroelectric resources of the country released for beneficial development under proper safeguards. Both Congress and the executive departments have recognized for years the inadequacy of existing laws; and although developments subject to revocable permits have been and are being made on the public domain, no development on navigable streams has been authorized by Congress since 1912. Thus three-quarters of the country's hydroelectric resources are either locked up or are so involved as to discourage development.

It requires on the average 1000 tons of coal to produce 125 hp.-years of electricity, so that 35,000,000 undeveloped water horsepower put to use would save the necessity of mining 280,000,000 tons of coal a year, the labor of from 500,000 to 750,000 men, and release 600,000 freight cars and 20,000 locomotives and equipment which is sadly needed for the transportation of products other than coal.

Association Affairs —

Plans have been made to strengthen state and geographic sections and to coordinate their activities with those of the national body. Moreover, much of the work formerly done by the national association will be delegated to the geographic sections, where regional questions can be better discussed and where national policies can be interpreted and modified to meet conditions. It is reasonable to expect that within the year the entire country will be organized along geographic lines.

It is proposed also to divide the work of the association among four national sections — public relations, technical, commercial, and accounting. The last three, which are now functioning, will be somewhat revamped, and the public relations section is entirely new. It will take up matters of public relations, regulation, finance and kindred managerial topics. The national executive committee will also be formed on more representative and democratic lines.

THE CONVENTION ATTENDANCE WAS OVER 2500 ON THE LAST COUNT.

Cooperation —

That one branch of the industry can prosper independently of the other is a fallacy. In the West, a great plan of cooperation of all the branches of the business has been worked out and put into effect in a satisfactory manner. This broad cooperation is commended for your earnest consideration because it will not only bring about sound financial benefits, but will assist us in giving that high standard of service to our consumers which is the object and aim of all properly conducted utility companies.

Report of Executive Manager

Extensive changes intended to simplify the organization of the national association and to foster the geographic section idea have been worked out by the present administration and were presented to the society by the executive manager, M. H. Aylesworth, receiving the enthusiastic support of the society.

Aside from a reorganization of the headquarters staff with a particular emphasis on the carrying on of publicity work, the most important division of this report was concerned with the development of the geographic section.

The field work carried on since October 1st not only has demonstrated that the work of the national association should be decentralized to a considerable extent and that the country should be divided into geographic divisions, but that there is a unanimous demand for the program of the Geographic Sections Committee, which provided for the division of the country into thirteen geographic divisions, including Canada, as defined and named on the accompanying map. The National Executive Committee, on its own motion or upon the application of one or more adjacent geographic divisions, may modify the boundaries or add to or subtract from the existing number of geographic divisions.

The plan as adopted provides for two types of geographic sections, one of which shall be composed of active state organizations and one which shall function as a unit without regard to state boundaries.

Assistance in financing the geographic divisions will be provided upon budgetary appropriation from the dues paid to the National Electric Light Association. The needs of each geographic division, in budget form, will be presented for approval to the National Executive Committee by the representatives of each geographic division upon the National Executive Committee.

Report on Water Power Development

One of the most animated discussions of the session followed the reading of the water power report which was given in full in the May 15th issue of the Journal of Electricity. In a discussion in which John A. Britton of the Pacific Gas & Electric Company, and C. L. Eglin of the Philadelphia Electric Company took part, the acute nature of the present situation was brought out, both in the necessity for pressing national legislation and in immediate development of water resources in the interests of fuel conservation. A. E. Wishon, assistant general manager of the San Joaquin Light and Power Corporation, brought out the interest which the public itself has in the development, which should be presented generally to the public in order to facilitate financing of the work to be done. In order that necessary legislation may be pressed and that already adopted carried out along equitable lines, a resolution was passed to continue the present water power committee as a permanent body.

Encouragement from Regulating Bodies

With the question of finance looming in such proportions before all the power companies of the nation, the frank discussion of rate regulation and financing problems by E. O. Edgerton, president of the California Railroad Commission, cleared the air and laid the foundation for sound future development. Commissioner Edgerton not only acknowledged the burden upon the regulating commission to reward efficiency where it occurred, but placed the burden for thus providing efficient service squarely upon the companies themselves. He urged the open discussion of the problems of financing, which he regarded as among the most acute which the electrical industry had to face. Expressing his own belief in the soundness of utility bonds as an investment, he urged the necessity of properly educating the public to overcome prejudices already existing. When such rewards do come to the company, they should be passed on down the scale, not being all confined to the president's office, in order that a loyal organization be built up and the public receive in service the advantages of the reward they have allowed. In conclusion he urged the greatest efficiency on the part of power companies as their only safeguard, even to the

extent of the unification as well as interconnection of all companies within a unit area, such for instance as the state of California.

Along similar lines was the masterly address of Carl D. Jackson, president of the Wisconsin Commission, during the third general session, who took a progressive stand on matters of rate regulation which offered encouragement to those contemplating new construction. The present trend of regulation is toward a greater stability, with a recognition that

To live up to their wild and woolly reputation the Westerners staged a realistic hold-up for the unsuspecting Eastern delegates to Pasadena arriving on the Red Special.

the holders of utility bonds are investors rather than speculators and that they should be protected. Taking the position that valuation is only one step in the fixing of a rate base which shall allow a fair return on the capital which has been invested, the commissioner pointed out that from this standpoint depreciation need not be regarded as an essential deduction from the rate base. He also urged the adoption of the indeterminate permit in preference to the short term franchise. In conclusion, he pointed out the necessity of making the public acquainted with the causes which underlie rate changes and urged that such a campaign, carried out by the electrical industry, be conducted with scrupulous impartiality, as only such fair-mindedness could reach the public confidence.

The Question of Municipal Ownership

The report of the committee on Electrical Resources of the Nation dealt largely with statistics on municipal ownership. The committee found that there were 2318 municipal plants throughout the country, as contrasted with 4224 commercial stations, which have something like 16 times the generating capacity of the municipal plants. The lower returns obtained by the private plant as well as the much more rapidly decreasing rate of net return stand out most prominently. Most municipal plants exist only where central station service is not otherwise given, and of the 139 cases where actual competition exists, so many of these purchase their energy in whole or in part from the power company that only 116 independent competing plants need be noted, of which 42 furnish energy only for city use.

Two most important recommendations were made by this committee—one on the necessity for starting a movement which shall encourage the regulation of municipally owned as well as privately owned utilities by their respective utility commissions, and the other, the collecting of statistical data concerning the operation of the electrical industry throughout the country and its publication in an annual statement.

Service as a Utility Watchword

Those who have followed the series of articles by S. M. Kennedy, vice-president of the Southern California Edison Company, which have been running through the Journal of Electricity, will appreciate the importance of the message which formed the backbone of the report of his committee on Public Relations at the Thursday morning general session. Mr. Kennedy discussed in his charming way the various aspects of good service, from the uniform worn by the meter reader to the publicity campaign which should help to maintain public good will, with such inspirational effect that those present were roused to great enthusiasm. The keynote of Mr. Kennedy's message may be summed up in one of the concluding paragraphs of his address:

"Just as long as there is a service to be supplied, just so long will there be possibilities for improving service. Service is distinctly progressive. What was good service one year ago, stands a chance of being considered ordinary service today, and what was rated ordinary service a year ago may possibly be considered poor service tomorrow. Through the efforts of thoughtful inventors and energetic engineers, the tangible service has shown constant improvement. The intangible service should also improve, through close study of the needs and preferences of the community, the adoption of advancing methods, and the practice of discernment in considering the personal equation when serving the individual. The aim of the utility company should ever be, not how little may be offered, but how much can be given. Is the question asked, "What are the limitations to good service?" The echoes from past experience, coupled with the call of the future, supply the answer—"There are no limitations." Good service will yet embrace many attributes heretofore omitted, overlooked and for the present undreamed."

Inductive Interference

The importance of the inductive interference situation and the necessity for some organized action on the part of the power companies to meet the consistent policy of the telephone company in the protection of their interests, was the plea made by the committee on inductive interference, whose report was jointly presented by J. E. Woodbridge of Ford, Bacon and Davis, and Geo. E. Quinan of Puget Sound Power and Light Company. Cooperation on the part of the telephone company was offered by the representative of those interests who was present and who urged joint investigation into the problem by both

John B. Fisken, consulting engineer with the Washington Water Power Company and president of the Northwest Light and Power Association, brought down an important representation from the Northwest Division who acted as joint hosts to the national convention with the Pacific Coast Section.

parties concerned. An active interest in this most important question was shown by power company officials as well as engineers, and prompt action along needed lines was promised.

Railway Electrification

From the report of the committee on the electrification of steam railroads which was presented as a symposium from the standpoint of the railroad, the power company, the construction company and the manufacturer, it was apparent to those present that the electrification of the more important lines of our steam railroads was only a question of time and that the real problems concerned were those of practical application. An important warning was sounded by J. A. Lighthipe of the Southern California Edison Company, who pointed out that railway lines as well as power companies are going to want to tie in to one another's systems at a later date and it is not too early to consider the question of a standardization which will make this possible. A. H. Babcock, electrical engineer of the Southern Pacific Company, pointed out the necessity of educating the operating men and executives of the railroad company as well as the electrical engineers of such companies.

Sale of Stock to Customers

The advisability of keeping public good will through taking the customer into partnership was the theme of both the report of the Committee on Public Information of which John F. Gilchrist is chairman, and of the Committee on the Sales of Company Securities to Customers and Resident Citizens. This method of disposing of company securities is of importance in financing, of course, but throughout the sessions it was still more emphasized as a method of keeping the public good will.

The Cooperative Campaign Idea

One of the features of the holding of the convention in California was the endorsement of the California Electrical Cooperative Campaign idea by all who had the opportunity of seeing its working and the results accomplished. The extension of this idea to national application was the gist of the report by the Committee on Cooperation in the Industry of which Lee H. Newbert, newly elected president of the Pacific Coast Section, is chairman, and Robert Sibley, editor of the Journal of Electricity, vice-chairman. The recommendation received the hearty endorsement of central station officials, manufacturers and jobbers alike. One of the important discussions of this paper in the brief time which was available, was the official endorsement of the cooperative campaign idea by the executive committee of the Electrical Supply Jobbers' Association, following the presentation of the plan at the Del Monte convention. They recommended the national application of the idea and urged that the two further branches of the selling of electrical securities and the improvement of public relationships to an even greater degree be added to the functions of the campaign. The jobbers offered their services on a joint committee which should consider the wide distribution of utility securities.

Public Policy Report

A large gathering of members and guests attended the open public policy meeting of Thursday evening at which John A. Britton, chairman of this committee, outlined a program of attainment for the coming year in one of the most inspiring addresses of convention. The review of relationships within the industry and between the industry and the public which it serves with a mark set for future achievement is one of the chief purposes of this yearly gathering, and the remarkable report of the Public Policy Committee formulated a vision of possibilities whose results will be seen in the practical attainments of the next twelvemonth. Among other recommendations, the committee urged the bringing of municipally owned utilities under the same regulation as privately owned and commended the Journal of Electricity for its questionnaire sent out to utility commissions the country over and for its campaign along these lines.

Technical and Commercial Sessions

The section meetings, which were in large measure the working meetings of convention, concerned themselves in great part with Western problems and discussions of unusual interest developed. Some of the more important questions brought out at these meetings will be considered at greater length at a later time in Journal of Electricity columns.

One of the interesting events at Convention was a fine industrial lighting demonstration, especially planned by the Industrial Lighting Division of the N. E. L. A. Lighting Sales Bureau, and given in connection with the Division's report at the Commercial Section session.

New Geographic Sections

Two new geographic sections were formed during the convention period, one the Southwest Division which covers the states of Texas, Oklahoma, Arkansas, Louisiana and Mississippi, and the Rocky Mountain Section, covering New Mexico, Colorado and Wyoming. A. Hargrave, vice-president Subsidiaries of the American Public Service Company, Dallas, Texas, was elected temporary chairman of the Southwest Division, while E. A. Phinney, president of the Jefferson County Power and Light Company of Golden, Colorado, was chosen chairman of the Rocky Mountain Geographic Division. The Southwesterners are urging Hot Springs, Arkansas, as the convention city for next year.

New Officers

Martin J. Insull, president of the Middle West Utilities Company, Chicago, was chosen president to head the association for the coming year. The following officers were elected to support Mr. Insull in his work:

First Vice-President—M. R. Bump, H. L. Doherty and Company, New York.
Second Vice-President—Frank W. Smith, United Electric Light and Power Company, New York.
Third Vice-President—Walter H. Johnson, Philadelphia Electric Company, Philadelphia.
Fourth Vice-President—Franklin T. Griffith, Portland Railway Light and Power Company, Portland, Ore.
Treasurer—H. C. Abell, American Light and Traction Company, New York.
Executive Committee—R. H. Ballard, E. W. Rice, Paul Spencer, W. H. Atkins, E. M. Herr, Walter Neumiller, D. H. McDougall, E. W. Lloyd, W. A. Layman, J. R. Owens.

The new president emphasized the advancement of public relationships as well as cooperation within the industry as the program particularly to be carried out during the next year.

The Journal of Electricity Commended

Among the resolutions passed at the concluding session of the Pasadena convention was one introduced by Arthur Williams, general manager of the New York Edison Company, thanking the McGraw-Hill Company for its contribution to convention in the form of the Convention Daily. Appreciation was expressed to the Journal of Electricity in particular for "its able and helpful cooperation with the Association and the great assistance offered to the Committee on Water Power and their hearty cooperation in the preparation of this report, the map and the compilation of Western data here presented."

ENTERTAINMENT FEATURES

Under the able management of W. L. Frost, chairman of the entertainment committee, a most elaborate program of entertainment was offered members and guests. Automobiles were available for sight-seeing trips on all occasions and many special features were arranged, such as the impressive performance of the Mission Play given Wednesday evening and the charming tea at the residence of Mr. and Mrs. John B. Miller on Thursday afternoon. The president's reception of Tuesday night, with its spectacular illumination and outdoor dancing, was a glittering success in spite of a slight fog which served only to enhance the beauty of the electrical effects. The cabaret dinner and big night of Friday were in the hands of the Pacific Coast Section, who throughout served as hosts in making Eastern visitors feel the true hospitality of the West. No possible courtesy, such as the providing of morning papers as well as gifts of fruit and bonbons for the lady guests, was overlooked, and unquestionably the attention given these pleasant details did much to make the Pasadena convention the success which it was felt to be by all.

Electrical Supply Jobbers Del Monte Convention

(The four days of the 1920 Convention of the National Electrical Supply Jobbers' Association which was held at Del Monte from the 11th to the 14th of May were filled with business inspiration and good times. A report of the discussions, lectures and reports of the regular sessions is given below along with the results of the various tournaments.—The Editor.)

When Vizcaino sailed into Monterey Bay in 1602, little did he think that some three hundred and eighteen years later men of the electrical supply jobbing business from all over the United States would assemble there to discuss the best methods for handling a business that this year promises to reach the billion-dollar mark. With the beautiful grounds of the Del Monte Hotel calling to the devotees of golf, tennis, swimming and all of the other out-of-door sports it is small wonder that the five days of the convention were made use of for both business and pleasure, and that in the evenings there were attractions such as the '49 camp to help take the mind of the busy jobber off of the trials of the day.

Outside of the regular business sessions the most important transactions were the golf tournaments, and the meeting on Friday morning when the California Cooperative Campaign was explained to the Eastern jobbers so as to show them the direct benefit that the jobbers as well as the rest of the industry derived from such a movement.

First Session

The convention was called to order at eight-thirty p.m., May eleventh, by Albert Elliot, secretary of the Pacific Division of the association. Mr. Elliot proceeded to introduce Robert Sibley, editor of the Journal of Electricity and Pacific Coast editor of Electrical World and Electrical Merchandising, who gave an illustrated lecture on "The Present Status of the Electrical Industry in the West and Its Future Possibilities." Mr. Sibley showed, by a series of charts and diagrams, that in the West today the electrical industry is more extensively developed than in any other part of the world. He showed, by referring to April, 1920, statistics of the United States

CONVENTION OF THE ELECTRICAL SUPPLY JOBBERS' ASSOCIAT

Geologic Survey, that the per capita use of hydro-electric power in the West is over six times that of the United States as a whole.

Sessions of Geographic Divisions

On Wednesday, May twelfth, there were three separate sessions in the morning, one of each of the

Judging by this picture and the intent attitudes of the people in the left foreground, the '49 Camp at the Jobbers' Convention was the real thing.

geographical divisions of the association, namely, the Atlantic, Central and Pacific divisions. In the meeting of the Atlantic Division, Mr. E. W. Rockafellow, of the Western Electric Company of New York, brought out the fact that sales policies although imperfect and at times narrow, were better than no policies at all, and emphasized the great importance of all jobbing companies having sales policies of some nature, for it is by such policies alone that constructive work in organization can be built up. "The question of a plan," he said, "is of vital importance to the jobbing business, as a sales plan enables the jobber to work out rational ideas on the basis of a low margin in profits."

In the meeting of the Central Division Mr. C. W. Banta, of the Wells-Fargo Nevada National Bank of San Francisco, brought out the fact that cooperation in the industry, particularly in the case of the contractor-dealer, has a direct effect upon the banking credit of the house and that this has been found especially true where broad cooperative policies have been instituted.

The meeting of the Pacific Division was taken up with a discussion of the question involving price fixing and particularly the boundary line beyond which the organization should cease to discuss the question of price fixing. Judge Thomas M. Debevoise, counsel of the association, brought out the fact that to restrain one's own trade is illegal, while to restrain the other man's trade is not only illegal but unfair and immoral.

Business Session

Thursday morning was given over to the business detail of the Jobbers' Association and to the report of the Society for Electrical Development. Mr. J. M. Wakeman pointed out the vital part the society is playing in furnishing to the magazines throughout the United States non-technical data relating to the industry. He also stated that advertising inserts and inquiries regarding things electrical were handled through his office and went on to ask for more substantial moral and financial support from the jobbers.

Goodwin Lecture

On Thursday night W. L. Goodwin of the General Electric Company gave a lecture, emphasizing particularly the fact that in such organizations as the N. E. L. A. and the E. S. J. A., "function" proves to be the thing of greatest importance to the organization. "Organizations must give greater attention to more clearly define their functions," he said, "and they must adhere to this policy."

Mr. Goodwin said further that the California Cooperative Campaign was the most constructive piece of work ever accomplished in the electrical industry. Speaking of the problems confronting the industry today, he said that the most urgent was that of financing public utilities, and went on to urge the jobbers and contractor-dealers to invest in public utility securities, thus setting an example to the general public.

California Electrical Cooperative Campaign

The meeting on Friday morning, May 14, was given over to the discussion of the California Cooperative Campaign. Mr. L. H. Newbert, chairman of the Advisory Committee, opened up the discussion by setting forth the vital facts that have led the central stations throughout California to encourage this movement. Mr. D. E. Harris, vice-president and sales manager of the Pacific States Electric Com-

ION, HOTEL DEL MONTE, DEL MONTE, CALIFORNIA

pany, then proceeded to show how the jobber has benefited through the campaign. He produced striking charts and statistics to show where sales agents and sales campaigns, instituted by the California Co-operative Campaign, have brought large increases in business. He then read a telegram from John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company and the noted dean of the electrical industry in the West.

A motley group at the Jobbers' '49 Camp. We think we recognize some of them in spite of the make-up, but we are not taking chances, and will let you pick them out for yourself.

May 12th, 1920.

Samuel H. Taylor,
Hotel Del Monte,
Del Monte, California.

Please express my regrets to Convention at inability to attend. You may be assured that nothing but urgent business necessities here prevented. Emory Wishon desires also to have me convey his regrets due to matters of importance occurring in Fresno. State to the Convention that as I view the situation with respect to the cooperation of central stations that the success of central stations in this state has been particularly strengthened by the cooperation of the manufacturers, jobbers and dealers. It is in fact a mutual arrangement that means a measure of success to both. So far as dealers are concerned central stations should in my judgment trust them implicitly in distribution of electric appliances under the cooperative plan. That should be the agency by which the energy is sold and I am hopeful that the present splendid arrangement in California will continue for many years to come to the advantage of all, and in this particular the slogan of the three guardsmen is especially applicable: "All for one and one for all."

JOHN A. BRITTON.

Clyde L. Chamblin, president of the California State Association of Electrical Contractors and Dealers, then gave the contractor-dealer's point of view and showed how the cooperative campaign has helped in the merchandising of their goods and has made four hundred boosters for the central stations. R. M. Alvord, of the General Electric Company, San Francisco, and a member of the Advisory Committee of the Campaign, closed the session by telling how one should proceed to institute a cooperative campaign in a new territory similar to California, putting particular emphasis on the necessity of securing competent leaders for the movement. "The best way," said Mr. Alvord, "is to get together a number of prominent men of all branches of the industry and from them pick a small committee which will be satisfactory to all."

Prior to the close of the meeting a resolution was passed commending the work of W. L. Goodwin, and a resolution commending W. M. Deming, Pacific Coast manager of the McGraw-Hill Company and the Electrical Trio, for the effective work done in making the convention a success.

TOURNAMENT RESULTS

Tennis

Men's Tennis Tournament:
- First prize—Winner, Gervais Hillis, Electric Appliance Company, San Francisco.
- Second prize—Runner-up, Guy P. Norton, Duplex Light Works of the General Electric Company.

Women's Tennis Tournament:
- First prize—Winner, Mrs. H. N. Gordon, Harvey Hubbell, Inc.
- Second prize—Runner-up, Miss Betty Bibbins, San Francisco.

Golf

Kickers Handicap Medal Play:
- First prize—Winner, H. E. Sherman, Illinois Electric Company, Los Angeles.
- Second prize—Runner-up, C. B. Hawley, Intermountain Electric Company, Salt Lake City.
- Third prize—Player turning in the low gross score—W. E. Robertson, Robertson-Cataract Company, Buffalo, N. Y.

Women's Putting Contest:
- First prize—Winner, Mrs. Clarence Wheeler, Wheeler Green Electric Company.
- Second prize—Runner-up, Mrs. W. J. Grady, Faries Manufacturing Company, Decatur, Illinois.
- Third prize—Best tie score, tie between: Mrs. Herstein, Electric Supply Company, Memphis, Tenn.; Mrs. J. O. Morris, Electric Supply and Equipment Company, Hartford, Conn.; and Mrs. F. S. Price, Pettingell-Andrews Company, Boston, Mass.

Tournament Medal Play:
- First trophy—H. C. Lucas, Philadelphia Electrical Appliance Company, Philadelphia, Pa.
- Second trophy—E. N. Hurley, Hurley Machine Company, Chicago, Ill.
- Third trophy—Mrs. Clarence Wheeler, Wheeler Green Electric Company, Rochester, N. Y.
- National Metal Molding Company trophy—J. I. Colwell, Western Electric Company, Seattle, Wash.
- Turner trophy—H. L. Garbutt, Westinghouse Electric & Manufacturing Company, San Francisco.
- Deming trophy—C. E. Listenwalter, Listenwalter & Gough, Los Angeles.
- The "Old Copper Cup"—C. E. Listenwalter, Listenwalter & Gough, Los Angeles.

H. B. Kirkland, of the Sprague Electric Works, and F. E. Blake, Hawaiian Electric Company, Ltd.

J. O. Wetherbie, General Electric Company, seems to have mislaid his horse.

H. Q. Foreman, Sibley-Pittman Electric Company, trying to remember where he left his coat when he started.

W. M. Stearns, special representative, General Electric Company, taking a constitutional.

W. H. Colman, General Electric Company, Chicago, wishes the player ahead would get out of his way.

F. H. Gale and H. R. Sargent, of the General Electric Company, having a friendly argument.

Pacific Coast Section National Electric Light Association

(The records of another important year in Pacific Coast history have been closed by the recent Pacific Coast Section N. E. L. A. Convention in Pasadena. Western problems were of necessity more or less in the background at the national meetings, but a tremendous amount of valuable discussion was crowded into the one day's session which served for the Western Section. A complete abstract of business transacted is here given.—The Editor.)

General Session—Opening Session

The Pacific Coast Section of the National Electric Light Association was called to order at 9:25 a.m. May 17th, by Robert Sibley, editor of the Journal of Electricity and Pacific Coast editor of the Electrical World and Electrical Merchandising, acting as chairman of the Convention Committee, Pacific Coast Section, N. E. L. A. Mr. Sibley introduced President A. Emory Wishon.

In Mr. Wishon's address he spoke of the spirit of the Pacific Coast Section, and laid emphasis on the fact that this Section was responsible to the National Association for its entertainment at this Western convention. Mr. Wishon brought out the fact that it was up to the Pacific Coast Section to tell the men from the East what the geographic section out here has done. He reviewed briefly the formation of the Pacific Coast Section, stating that the men of the Pacific Coast felt the need of a local body to get action and results. The wonderful success of the California Electrical Cooperative Campaign has invaded the East and the success of this and of the Pacific Coast Section has been a national incentive and example as to what can be done along these lines. "The problems of the industry are the common problems of all branches of the industry," he said, "and one of the reasons for the success of the California Electrical Cooperative Campaign and the Pacific Coast Section is the fact that the jobber and manufacturer, the contractor-dealer, and the central station men, have placed all of their cards upon the table."

Geo. A. Hughes, president of the Edison Electric Appliance Company of Chicago, Franklin T. Griffith, president of the Portland Railway Light and Power Company and A. E. Wishon, assistant general manager of the San Joaquin Light & Power Corporation and retiring president of the Pacific Coast Section, N. E. L. A., enjoying the hotel veranda.

Mr. Wishon made a plea to the men of the Pacific Coast Section to sell the California idea to the men of the East and make them understand the requirements and possibilities of the development of the electrical industry in California.

In closing Mr. Wishon recommended certain changes in the by-laws of the association, as follows:

First—That the annual meeting be called prior to the first of July.

Second—That the fiscal year be changed from January to January, to July to July. Under this system each president would be responsible for the financial condition of the Section during his term of office.

Third—That the membership be extended to include members of municipal plants.

Fourth—That representatives of all branches of the industry be appointed on all committees.

Fifth—That the right to vote be extended to members of all classes.

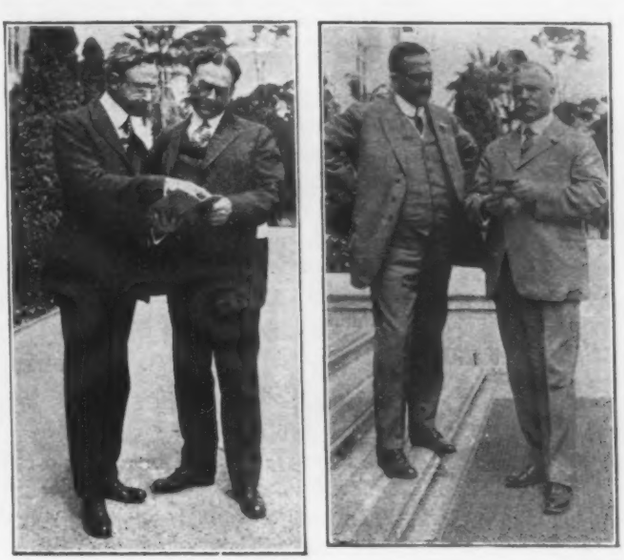
Secretary's Report

The report of Secretary A. H. Halloran, of the McGraw-Hill Book Company, reviewed the preceding year as a most successful one in the section's history. Mr. Halloran stated that the section started in the fiscal year with a balance of less than $100.00 and closed with a surplus of over $4,000.00, and that the membership has increased from 676 in 1919 to over 2000 members at the present time. The largest increase in this membership was in Classes D and E.

Mr. Halloran went on to say, "The outstanding feature of the Section's accomplishments during the past year has been President Emory Wishon's campaign to sell the idea of self-interest. His efforts have not only created many new converts to public utility securities, but have established more freely the public relations toward the power companies."

Mr. Halloran closed by stating that on account of the demands of his new position, he would be unable to accept reappointment to his office.

The report of the Committee on Cooperation was not given, as Chairman T. E. Bibbins was unable to be present.



Two better merchandising movements were represented at convention—Dave Harris and Lee H. Newbert, both of the Advisory Committee of the California Electrical Cooperative Campaign, are on the left, while J. M. Wakeman, general manager of the Society for Electrical Development, is talking with Charles H. Woolley of the Sunset Magazine (on the steps) on the right.

DELEGATES AND GUESTS AT THE PACIFIC COAST SECTION N. E. L. A. CONVENTION

Report of Publicity Committee

I. W. Alexander, publicity manager of the San Joaquin Light & Power Corporation, made the report for the Publicity Committee, stating that the committee had been organized along the lines of the co-operative idea, and that while the press service bulletin had been started, lack of funds had forced them to discontinue it. He recommended that the next committee carry this on, as it was considered an excellent plan, and that other geographic sections be kept in touch with what California was doing, as he believed that this would do more than anything else to keep the Pacific Coast Section before the eyes of the rest of the industry.

Committee Appointments

Following committees were appointed by Mr. Wishon:

Committee for the Change of the Constitution—L. H. Newbert, commercial manager, Pacific Gas & Electric Company, San Francisco, chairman; A. B. West, general manager, Southern Sierras Power Company; A. W. Childs, superintendent of sales, Southern California Edison Company.

Nominating Committee—S. M. Kennedy, vice-president, Southern California Edison Company, chairman; Samuel Kahn, president, Western States Gas & Electric Company; D. E. Harris, vice-president and sales manager, Pacific States Electric Company; Ralph Clapp, manufacturers' agent, Los Angeles; Robert Sibley, editor Journal of Electricity, Pacific Coast editor of Electrical World and Electrical Merchandising.

Committee on Resolutions—Henry Bostwick, Pacific Gas & Electric Company, chairman; A. B. Day, Los Angeles Gas & Electric Company.

Before the close of the meeting Mr. R. H. Ballard, president of the National Electric Light Association and general manager of the Southern California Edison Company, said that he had two statements to make:

First, that he wished to congratulate the Pacific Coast Section on the termination of an extremely successful year, and urged the members to adopt the changes in the constitution as recommended by A. E. Wishon.

Second, that the Pacific Coast Section members must bear in mind that they were the hosts of the men from the East and put up with the inconvenience of living so far away from the convention hotel. That the Pacific Coast members must be ready at all times to assist the members from the East in every way possible, and that this assistance should be active and not passive.

During the meeting Mr. Ballard took occasion to speak of the excellent work done during the past year by H. N. Sessions as chairman of the membership committee, in increasing the membership during his term of office from 676 to well over two thousand. Mr. Ballard said that Mr. Sessions was not present to give his report because at that time he was in the lobby of the hotel rounding up some more new members.

GENERAL SESSION—AFTERNOON

Fuel Oil Production

The discussion of the fuel prices proved that this was one of the most vital problems before the industry in the West. According to J. E. Woodbridge and John A. Britton, the industry is now facing a crisis in the matter of fuel oil production and it may shortly occur that many of the present uses of fuel oil will be seriously curtailed in order that sufficient fuel may be available for general power production. It was shown that the price of fuel oil in California has increased perhaps more than that of any other commodity, as from 1915 to date the price of fuel oil has increased from 80 to 218% and all fuels and lighting in the United States from 100 to 190%.

In California the remedy is to develop, as rapidly as possible, the water powers now going to waste so that the railroads now consuming valuable fuel oil may be supplied with electric power and other electrical producing plants consuming fuel oil may be relieved. It was noted by Mr. Woodbridge that in California 40 per cent of the oil producing companies owned 20 per cent of the wells, but produced only five per cent of the oil. This shows that a large number of the California wells produce such small quantities of oil that it is an economic impossibility to drill other wells at the present high cost of supplies, and that no relief may be looked for through increased production.

Robert Sibley, of the Journal of Electricity, stated that already steps are being taken in the various parts of the West to decrease the consumption of fuel oil through replacing it with other fuels such as pulverized coal and hogged fuel.

Rating of Motors

In discussing the paper, "Central Stations and the Rating of Motors," by John Hood of the General Electric Company, San Francisco, Carl E. Johnson of Los Angeles said: "In the brief time allotted to me for discussion of Mr. Hood's paper, I shall attempt

GROUPED ON THE LAWN OF THE HOTEL HUNTINGTON, PASADENA

to hit only the high spots and point out a few additional facts, confining my remarks particularly to polyphase motors of smaller than 75 horsepower.

"A careful analysis of all phases of the 40 and 50 degree motor question seems to point out that the little skepticism with which the continuous rated motor meets is largely without foundation. This is probably for the reason that they are comparatively new and that so very little seems to be known about just what the designing engineers and manufacturers have, up to this time, given us.

"The accompanying table gives a compilation of interesting data that has been taken from actual test records and performance guarantees of representative makes of standard motors of different horsepower ratings, speeds, etc., that will serve as a basis of comparison of the 40 degree and the new 50 degree motors as we actually know them today.

"The data given is typical and representative of both lines of modern standard motors now on the market between the sizes of 1 to 75 hp., and will bear out the fact that the 50 degree motor is very much better than is generally believed and will also prove that the designing engineer and the manufacturer have really put and built something more into the 50 degree motor than merely giving it another name.

"The progress of the electrical art is a matter of common knowledge and no engineer will deny that motor design and construction should come in for its share of development. Is it not logical, then, that the design of motors as new as the so-called 50 degree motors should incorporate all that has been learned since even the latest type of 40 degree motors were designed? I believe most engineers will agree that in very recent years much has been learned of motor design and construction, particularly of the feature of efficient and thorough motor ventilation, the advantages of which 50 degree motor designers undoubtedly have availed themselves of to a greater extent than heretofore.

"When you stop to think that these wonderful results have been obtained with the use of less material, it must surely be conceded remarkable and is indeed a credit to the motor manufacturer making their introduction worthy of the heartiest cooperation of all interested in motors.

"It has been shown that only about 10 per cent of all 40 degree motors are overloaded. If this is true, why should the other 90 per cent of all other motor users be penalized and made to pay more just to accommodate the 10 per cent that are overloaded? At the prices prevailing today 40 degree motors, as nearly as can be averaged, cost approximately 12 per cent more than the corresponding 50 degree, so that it is evident that the premium in providing for the occasional overload, which exists in about 10 per cent of installations made, is very heavy indeed. Furthermore, this does not take into consideration the increased cost to provide proper transformer capacity and the increased cost of installation and operation of the 40 degree motors."

The speaker said that for the consumer the 50 degree motor will mean better all-around efficiency for less money and less cost to install and maintain; that it would mean a better power factor, with less transformer capacities, wiring auxiliaries, accessories, etc., required, with resulting less cost for the central station; and that to the contractor-dealer and machinery dealer who sell motors is bound to come additional business through increased number of installations and sales, because of the increased popularity of individual motor drives resulting from lower first cost of motor and installation and lower cost to operate.

He further stated: "The motor manufacturer has spent much money and thought on his problems of design and production and gives you today a highly efficient and standardized product, into which is incorporated many features that lessen both the central station, contractor-dealer and motor users' trouble, such as indestructible rotors and other improvements, but he is not yet fully satisfied, and he is still on the job trying to attain something better."

Mr. C. E. Ingalls of the Crocker-Wheeler Company, San Francisco, next took up the discussion of Mr. Hood's paper, and taking the opposite side, said:

"The advocates of the 50 degree rating claim that our knowledge has increased to such a degree that it is now possible to make an exact motor selection; others claim that such exactness is impossible, and that a factor of safety is required. Exact predetermination of a load is usually impossible, due to lack of sufficient accurate data so that careful engineering would demand a factor of safety. Even if the

COMPARATIVE PERFORMANCE TABLE OF REPRESENTATIVE 50 AND 40 DEGREE STANDARD POLYPHASE SQUIRREL CAGE INDUCTION MOTORS BETWEEN 1 AND 75 H. P.

Motor No.	EFFICIENCY								POWER FACTOR							
	¾ Load		¾ Load		Full Load		1¼ Load		¾ Load		¾ Load		Full Load		1¼ Load	
	50°	40°	50°	40°	50°	40°	50°	40°	50°	40°	50°	40°	50°	40°	50°	40°
I	85.0		86.0		85.0				71.5		82.0		86.5			
II		83.5		85.5		85.5		83.5		64.5		76.5		83.5		88.5
III	87.0		88.0		87.0				74.0		84.0		88.0			
IV		87.0		86.5		86.0		82.5		76.0		86.0		89.5		91.0
V	88.5		89.5		88.5				76.5		85.0		89.0			
VI		86.5		88.5		87.5		86.5		82.5		88.5		91.5		92.5
VII	91.0		91.5		90.5				85.0		90.5		92.0			
VIII		87.5		89.5		89.5		88.5		82.5		88.5		91.5		92.5
IX	89.5		90.5		89.5				75.5		84.5		87.5			
X		88.5		89.5		89.5		88.5		70.5		81.5		86.5		88.5
XI	89.5		90.5		90.0				88.5		92.5		93.5			
XII		91.0		92.5		92.5		91.5		82.0		89.5		92.5		93.5
Averages	88.4	87.3	89.3	88.7	88.4	88.4		86.8	78.5	76.3	86.4	85.1	89.4	89.2		91.1
*Differences	+1.1		+.6		0				+2.2		+1.3		+.2			

*A positive result is in favor of the 50° Motor. Average full load temperature rise of the above 50° Motors is 33.2° centigrade—minimum 26° and maximum 40°.

load could be exactly predetermined there is no guarantee that this load would not change.

"The acid test is whether 50 degree motors can be applied safely. The verdict regarding dependability rests with the motor user, and careful investigation has shown that this verdict is being given by an ever increasing number of motor users who insist on 40 degree motors—who say they are finding that they require 40 degree motors with a reasonable margin of safety to insure continuous untroubled operation."

In closing the discussion, Mr. Hood said that the objections quoted by Mr. Ingalls were the same as had always been presented, and that the engineer must decide between the two viewpoints for himself.

Railway Electrification

The next paper to be discussed at the general session in the afternoon was "The Commercial Aspect of Railway electrification," by E. B. Criddle, W. L. Frost, and G. B. Kirker.

Mr. Criddle started the discussion of the paper by briefly sizing up its salient features and then turned the paper over to Mr. Kirker of the Westinghouse Company for further discussion. Mr. Kirker said:

"The railroads of the country which have electrified their lines, have demonstrated that electric motive power is superior to steam. With the ever increasing cost of fuel, along with the necessity of hauling heavier trains, a great many of the roads are considering electrification. This is especially true of the railroads on the Pacific Coast.

"One feature which retards electrification is the first cost, another will be the development of the necessary power, unless the proper legislation is enacted, to assist instead of retard the development of the water power. If the railroads can purchase cheap power, one of the big items of first cost is eliminated."

In concluding his discussion, Mr. Kirker stated:

"The central station which furnishes the power for the railroad would in a reasonable length of time be furnishing electric power to the towns, mines, saw-mills, pumping plants, and the various industries in all the region tributary to the railroad. Such an arrangement would develop the territory. The central station, in finding an outlet for its power, would increase the industries and this would increase the business of the railroads. As both the railroads and the central stations are public utilities, each should remain in its own special line, one furnishing transportation, the other furnishing power, and unite in the endeavor to increase the commercial wealth of the country."

Mr. R. W. Clark of the Puget Sound Power & Light Company was the next to take up the discussion. He spoke of the particular instance of the electrification of the Chicago, Milwaukee & St. Paul Railroad. Mr. Clark stated that from the central station point of view, electrification is desirable for three reasons:

"First—It brings about the interconnection of different power companies.

"Second—The railroad load is desirable as it raises the load factor.

"Third—The electrification of a railroad demonstrates the wonders of electricity to the public and makes for friendly relations with same. The diversity of the railway load has distinct advantages, and in the Northwest has brought about a large increase in the number of consumers."

The paper by R. E. Fisher of the Pacific Gas & Electric Company was read by the secretary, as Mr. Fisher was not present. In his paper Mr. Fisher quoted from the report of Samuel Insull, president of the Commonwealth Edison Company of Chicago, bringing out the point that the railroads in the last few years have had a great deal of trouble in raising the necessary capital to take care of their expanding business, and that they have had to pay relatively high prices for it. The question of the electrification of their local terminals and trunk lines is a question which involves two things: First, the successful conversion of the existing equipment; second, the raising of the capital to do the work.

The opportunity of the central station, according to Mr. Insull, is simply to stand ready to sell energy to them when they want to buy it from us.

Mr. Fisher went on to point out that, in his opinion, one of the first essentials would be the fixing of a definite kilowatt-hour cost to be paid by the railroad, and second, the possible amount of power which could be set aside for railway electrification at some period in the future.

Mr. Fisher closed by saying:

"I wish again to reiterate that the mission of the central stations in this most important matter is to so program the entire problem that it will automatically create a demand, and will bring such an influence to bear on the Federal Government that the present restrictions on hydroelectric development may be withdrawn and the entire matter encouraged from the viewpoint of conservation and general national economy."

Cooperation with the Architect

The next paper to be discussed was that written by Garnett Young, general manager of the Garnett Young Company of San Francisco, on "How the Electrical Industry Can Cooperate with the Architect and Builder." In the absence of Mr. Young, K. E. Van Kuran read a summarization of the paper which had been written by Mr. Young. The point was brought out that the paper had been written in such language as to make it readable by and acceptable to the professions that the industry is trying to interest.

"To this end, a number of paragraphs of the paper were devoted to establishing for the benefit of the architect and builder a complete alibi as to past sins of omission which have resulted in the present deplorable insufficiency of wiring homes.

"The article places the blame on the industry for having spread the doctrine of attaching to a socket everything from an incandescent lamp to a washing machine, thus misleading the public into a belief that the socket answers for every connection just as a switchboard does for current control. This is wrong, particularly, from the viewpoint of service affecting the consumer's ultimate interest and an argument is made that the problem should be solved by the employment of flush wall receptacles on the scale of an outlet for every appliance."

The first person to discuss the paper was Lee H. Newbert, chairman of the Advisory Committee of the California Electrical Cooperative Campaign, who said there was only one side to the question with no room for argument, and that the paper must be considered of great value to both the industry and the public.

John A. Britton, of the Pacific Gas & Electric Company, said that in his opinion more stress should have been placed upon the selling of the idea to the architect, as the contractor and builder would hesitate to make extravagant suggestions in the wiring of the home for fear of losing the job, whereas the person who was building the home would usually accept the architect's advice.

Mr. Britton closed by saying that the success of the convention should not be measured by the papers presented, but by the number of ideas that were carried home from it and put into actual practice.

Mr. Clyde Chamblin, president of the California State Association of Electrical Contractors and Dealers, took up the discussion by stating what it meant to the contractor-dealer to have all homes completely wired. Mr. Chamblin went on to point out that, in his opinion, the contractor-dealer should not let dollars and cents usurp leadership of the policy of "service to the public" and the "uplift of humanity." He pointed out the possibility of the electrical contractor making the home a real home in every sense of the word instead of a place to eat and sleep, and referring to the home, spoke of it as the greatest central station in the world. He said further that the work of electrifying the home must be carried out by appealing to the woman.

Mr. H. L. Harper, manager of the Western Electric Company of Los Angeles, then took up the discussion, and stated that the job ahead was two-fold:

"First—Should we not immediately through cooperative effort take our message direct to the public so that they will demand of their architects, building contractors, building investors and contractor-dealers a suitable installation?

"Second—Should we not through cooperative effort take our message directly to the public through the architects, building contractors and building investors?"

In closing, Mr. Harper made the following statement, which brought out the viewpoint of the jobber regarding Mr. Young's paper:

"What better evidence is needed that 'convenience outlets' form the 'neck of the bottle' than the data compiled by the Society for Electrical Development, which shows that where convenience outlets are installed 97% of the labor-saving appliances are being used daily and performing the service for which they were purchased, while in homes not properly wired only 60% are in use, the balance being 'on the shelf' or 'entirely discarded'?

"Unless this problem is met along some such lines as suggested by Mr. Young, we are all going to suffer and our possibilities for a bigger and more profitable business will be curtailed—so, as jobbers, we heartily endorse the plan and offer our support to bring about the result desired."

R. M. Alvord of the General Electric Company of San Francisco then finished the discussion of Mr. Young's paper by stating that it has been an incentive to the California Electrical Cooperative Campaign to start something along these lines. Mr. Alvord put a great deal of stress upon the fact that while we are wiring homes today in the manner we believe to be adequate, we must not forget to look to the future, and the great number of new appliances that will surely come. He spoke of the electrical homes being built in San Francisco, Oakland, Sacramento, and Los Angeles, and plans for building other similar homes throughout the state.

California Cooperative Campaign

A report of the California Electrical Cooperative Campaign Committee was made by Lee H. Newbert, chairman of the executive committee of the Campaign. He briefly sketched the history of the Campaign and the various activities it has engaged in in bringing the electrical industry to a higher plane.

Included in this was the work of the field representatives and the wiring expert; the building of model electrical homes, and wiring diagrams of houses with adequate outlets; the increase in advertising done by contractor dealers, and other work tending to make of the electrical contractor a better business man.

In closing, Mr. Newbert said:

"In conclusion, your committee wishes to express its conviction that the results thus far accomplished have more than justified the effort, and that it is confident of even greater progress in the future. With its organization in working order and its period of trial happily past, the California Electrical Cooperative Campaign should meet with continued success."

Appliance Solicitors

A. W. Childs, assistant general agent of the Southern California Edison Company, then presented his paper on "The Value of Appliance Solicitors" for discussion, and briefly told of the early efforts to sell electrical appliances, which was made possible only by the house to house solicitor leaving the appliances there for trial. Mr. Childs pointed out that the solicitor was an educational agent, and stated that, in his mind, the field should be worked by the solicitor, not only once, but time and time again.

D. E. Harris, of the Pacific States Electric Company, then took up the discussion, and said that service to the public was absolutely necessary. Otherwise all of the other work was of no use. He pointed

out that Mr. Young's paper and Mr. Childs' paper were very closely allied, and suggested that the contractor-dealer put on enough solicitors so that every home in the state would be visited at least three or four times a year.

Captain Howard W. Angus, secretary of the California Electrical Cooperative Campaign, in discussing electrical advertising, stated that the Campaign had in preparation a bulletin of instruction in advertising. This bulletin was prepared so that it might be used as a manual to be followed by the contractor-dealer, and embraced newspaper advertising, advertising by mail, by letters and booklets. The book also contains valuable suggestions for advertising by signs, bill boards and moving pictures, with a special chapter on store and window displays. This bulletin will probably be ready by the middle of June and will prove of inestimable value to the members of the electrical industry who are not able to carry an advertising man on their staff.

This finished the discussion of papers, and immediately the closing session was started.

BUSINESS SESSION

The first report to be accepted was that of the Committee on Constitutional Amendments. Lee H. Newbert, chairman, of the Pacific Gas & Electric Company, stated that the committee had acted upon the recommendations of President Wishon, and the following changes were adopted as read:

Article 1, Section 1; Article 1, Section 6; Article 1, Section 8; Article 1, Section 10; Article 1, Section 11; Article 4, Section 7; Article 5, Section 2; Article 6, Section 1; Article 6, Section 2; Article 7, Section 1; Article 8, Section 1; Article 9, Section 1.

Henry Bostwick, of the Pacific Gas & Electric Company, chairman of the Resolutions Committee, presented the following resolutions which were adopted as read:

"**Resolved,** That the Pacific Coast Section requests the National Electric Light Association in its convention assembled to give full thought and consideration to ways and means of raising the vast sums of money which will be required for the development of the hydroelectric resources of the state of California and other commonwealths of the nation, which will mean so much in conservation of the exhaustible fuels, particularly coal

"**And be it further Resolved,** That it is the sense of the Pacific Coast Section that such support on the part of the National Association will be necessary to enable the various operating companies of the nation to carry out their several financial programs and to enable them to meet the unprecedented demands being made upon them for additional electrical energy.

"**Resolved,** That this Association tender to the Journal of Electricity and its editorial staff its hearty commendation for the work that it has done for the industry during the past year, and more particularly for the powerful contribution it has made in connection with the Water Power Committee's report that is to be presented to the National Electric Light Association Convention this week;

"**And be it further Resolved,** That the Pacific Coast Section is especially indebted to Mr. Robert Sibley for the time and energy which he has devoted to the promotion of its interests.

"**Resolved,** That the Pacific Coast Section desires at this time to express to the California Electrical Cooperative Campaign Committee its appreciation for the constructive work which it has done and is doing by developing the spirit of cooperative relationship between the various electrical interests, resulting in a far greater use of electrical energy for all purposes.

"**And be it further Resolved,** That it is the recommendation of the Pacific Coast Section that the work of this committee be continued, and that the Pacific Coast Section pledges this committee its full and unqualified support in the future.

"**Resolved,** That a vote of thanks be tendered to the outgoing officers of the Pacific Coast Section for the wonderful work which they have done during the past year, as shown by the report read before the convention by Secretary Halloran; and more especially to our president, A. Emory Wishon, for his untiring efforts as well as the time and the study he has given to the self-interest problem of our industry as a whole, and which has now become of nation-wide interest.

"**Also be it further Resolved,** That all of the recommendations which have been made by President Wishon in his opening remarks receive full thought and consideration at the hands of the officers-elect."

S. M. Kennedy, vice-president of the Southern California Edison Company, made the report of the Nominating Committee, as follows:

President—Lee H. Newbert, Pacific Gas & Electric Company.
First Vice-President—A. B. West, Southern Sierras Power Company.
Second Vice-President—J. B. Black, Great Western Power Company.
Treasurer—A. E. Morphy, Southern California Edison Company.
Executive Committee—L. H. Newbert, Pacific Gas & Electric Company; A. E. Wishon, San Joaquin Light & Power Corporation; A. B. West, Southern Sierras Power Company; J. B. Black, Great Western Power Company; A. E. Morphy, Southern California Edison Company. Three-at-Large—Geo. A. Campbell, Truckee River General Electric Company, representing Nevada; C. M. Einhart, Roswell General Electric Company, representing New Mexico; R. S. Masson, Arizona Power Company, representing Arizona. Class A—Wm. Baurhyte, Los Angeles Gas & Electric Company; H. H. Jones, San Diego Consolidated Gas & Electric Company. Class B—Wm. Shepard, California-Oregon Power Company; Henry Bostwick, Pacific Gas & Electric Company. Class D—G. E. Arbogast, F. E. Newberry Electric Company; W. M. Deming, McGraw-Hill Company. Class E—D. E. Harris, Pacific States Electric Company; K. E. Van Kuran, Westinghouse Electric & Manufacturing Company.

The nominations were accepted unanimously, and Mr. Kennedy and Mr. Robert Sibley were requested by President Wishon to lead the new president up to the stage, where Mr. Wishon complimented Mr. Newbert and the Pacific Coast Section upon the election of such a man as president.

In accepting the gavel from Mr. Wishon, Mr. Newbert made a plea for the cooperation of the entire membership, without which he said he would be unable to lead the Section through a successful year.

ENGINEERING SESSION

Mr. P. M. Downing, chairman of the Engineering Committee, read the report of his committee covering the activities during the past year. The principal work performed by the committee was on the subject of insulators and line codes. Under the supervision of Dr. Harris J. Ryan of Stanford University, the work began in former years on insulator investigation has progressed to the point where it now appears that the solution of the insulator problem is in sight. The investigations made by the committee cover a large number of fatigue tests and electrical tests on several hundred sample inslators.

The work of the line code committee and the work on the utilization code has progressed satisfactorily. The latter code is now being finally revised and will, no doubt, be accepted by the Industrial Accident Commission and the Railroad Commission.

In the discussion of the paper on "Relay Protective Systems," by G. E. Armstrong, H. A. Barre of the Southern California Edison Company described at length the progress made by his company in the development of relay protective devices. Of particular interest is the balanced relay protective scheme, which consists of single phase, mechanically balanced current coils, arranged for the opening of the defective line of two parallel lines. Mr. Barre reported that this relay has been put into operation and has proven quite satisfactory.

In the general discussion of this problem, it was considered for the most part that more attention might well be given to this important phase of transmission line operation. J. A. Lighthipe of the Southern California Edison Company, C. O. Poole of the Southern Sierras Power Company, and E. R. Stauffacher of the Southern California Edison Company brought out a number of points regarding the peculiarities of the Western transmission systems in connection with short circuit currents that occur during disturbances. On the lines typical of the West, the currents do not reach the magnitude of those experienced where short large capacity lines are connected with turbo generators.

Other methods of relay protection were discussed by J. P. Jollyman, Pacific Gas & Electric Company, and J. E. Woodbridge of Ford, Bacon and Davis, San Francisco. Mr. Woodbridge brought up the proposition of installing a reactance between the neutral of the high tension windings of star connected transformers and ground to take the place of either resistance or a slight ground. The theory of this protection is that the reactance should be so selected as to counteract the capistance of the transmission line and thereby decrease the current which would flow to ground on the occasion of a short. R. J. C. Wood, Southern California Edison Company, Los Angeles, pointed out that a reactor and a condenser in series might lead to a condition of resonance.

J. P. Jollyman illustrated the application of residual current relays for connection between the current transformers used to supply current to inverse time limit relays in the neutral wire which would cause the operation of switches only when there was current flowing to ground. This form of relay would, therefore, act on all unbalanced currents to earth such as would result only when trouble occurred.

Power Factor and Rates

In the discussion of the paper by E. A. Quinn on "Power Factor and Rates," the principal points discussed were the availability of static condensers for use in industrial plant installations. At the time it has been found that static condensers are justified from the cost standpoint between installations from 50 to 300-kva. in 1100 and 2200-volt sizes, as well as 440-volt ratings. J. C. Clark and A. G. Jones of the General Electric Company, San Francisco, spoke of the success which has attended such installations in the past. L. M. Klauber of the San Diego Consolidated Gas and Electric Company, stated that it appeared preferable to determine the average power factor of consumers of different classes and demands, and base the rate upon these rather than to meter each installation and determine the rate in that manner. C. O. Poole of the Southern Sierras Power Company favored this method of rates based on power factor; while others, particularly J. P. Jollyman, Pacific Gas & Electric Company, E. J. Crawford of the San Joaquin Light & Power Corporation, and R. H. Halpenny of the Southern Sierras Power Company, favored the installation of either the static or the synchronous condenser at the load distribution center and the inclusion of charges based on the interest and maintenance expense of the equipment in the consumer's bill. Others, while favoring the use of rates based on power factor, believed that the complexity of the rates and the difficulty of determining from time to time in a fair manner the power factor of installations, rendered the application of power factor rates prohibitive. Among those holding this view are P. M. Downing of the Pacific Gas & Electric Company, and J. A. Koontz of the Great Western Power Company, San Francisco.

C. A. Johnson, of the U. S. Electric Company, Los Angeles, in discussing the design of motor equipment which would operate at higher power factors than the present induction motors, stated that careful tests indicated that the motors now being marketed on the 50 degree basis operated not only at higher efficiency, but also at a higher power factor than motors formerly rated on the 40 degree basis.

COMMERCIAL SECTION

The Commercial Section started promptly at 10 o'clock with K. E. Van Kuran, general manager of the Westinghouse Electric & Manufacturing Company, Los Angeles, presiding.

In presenting his report, Mr. Van Kuran stated:

"Demand in excess of supply is always a delightful situation for the producer, provided it does not get out of hand or proceed for such a length of time as to seriously retard the initiative of the producer, and permanently affect the confidence of the consumer in the reliability of service."

Mr. Van Kuran then proceeded to sum up the existing shortage in the state and the steps that have been taken to remedy the situation, and quoted Mr. H. G. Butler, the power administrator for the Railroad Commission of California, as stating that in view of the proposed interconnections in the state, and the total of 282,250 kilowatts that were to be added to the present supply by the end of 1921, another such dry year would not work such a hardship on companies and consumers.

Mr. Van Kuran summed up the papers that were to be presented for discussion, and in conclusion stated that the committee had found the industry unanimous in praise of the work being done by the California Electrical Cooperative Campaign under the direction of their advisory committee and their field representatives.

The Commercial Committee recommended to the Executive Committee of the Pacific Coast Section the official endorsement of the plan being worked out by the Advisory Committee of the California Electrical Cooperative Campaign to form, under the direction of the Advisory Committee, their field men and their salesmen's auxiliary, local bond and stock holding clubs. According to the plan, these clubs are to be organized in each office, store, and plant of the manufacturers and the jobbers, and in the local sections of the California State Association of Electrical Contractors and Dealers, for the purpose of supporting the financial plans of their local power companies.

Illumination

In opening the discussion of his paper on "The Value of Proper Illumination," H. D. Fagan, of the National Lamp Works of the General Electric Company, San Francisco, dwelt on the importance of the paper to salesmen, contractor-dealers, jobbers, and in fact all of the industry. He dwelt briefly on the value of proper lighting and window displays, told the meeting to make a broad plea for street lighting, appealing to the civic pride, but most important of all, Mr. Fagan said, was the problem of the lighting of industrial plants.

Hugh Kimball of the Kimball Electric Comapny of Oakland, in discussing the paper brought out the fact that the value and necessity of proper illumina-

(Continued page 583)

San Francisco's Electrical Home

(The home of today seems inconvenient when compared to the completely equipped one predicted as the regulation American home of tomorrow. The model electrical home which has been equipped through the efforts of the California Electrical Cooperative Campaign and various San Francisco business houses, will give to the public a glimpse of the convenience and luxury brought about by the use of electricity throughout the entire house, and will also give the public an idea of the service which the electrical industry is rendering in raising the entire nation's standard of living.—The Editor.)

Through the efforts of the California Electrical Cooperative Campaign and various business houses in San Francisco a model electrical home has been built, correctly wired and furnished completely and will be opened for inspection to the public on the 4th of June. This modern eight-room, two story, stucco house was built in St. Francis Wood by Mason-McDuffie Company, Henry H. Gutterson being the architect. Through the efforts of Mr. Walter F. Price, architect of the campaign, Mason-McDuffie agreed to let the campaign furnish the wiring diagram and use the house for a practical demonstration of how completely an average home can be electrically furnished. The furniture, lamps, mirrors, etc., have been furnished by L. Kreiss and Son; the electric piano by Byron Mauzy; the electric victrola by Sherman, Clay and Company; the current has been furnished gratis by the Pacific Gas and Electric Company and the various appliances by the following jobbers: Pacific States Electric Company; Electric Appliance Company; Electric Railway and Manufacturers Supply Company; Electric Manufacturing Company; Western Electric Company; Alexander-Lavenson Company; Electric Supply Company; Dunham, Carrigan and Hayden and The Majestic Electrical Development Company.

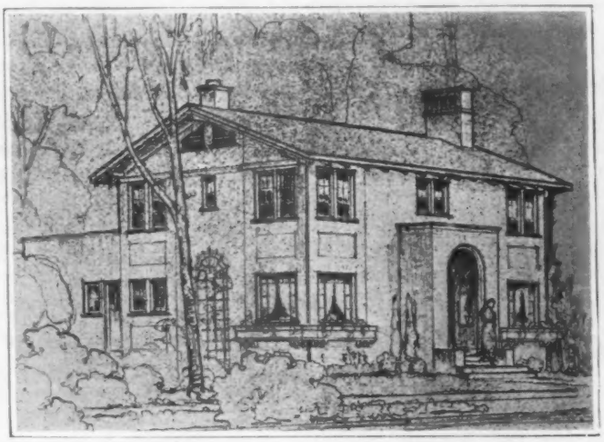
KITCHEN
Electrical range
Utility motor
Circular water heater
Dish washer
Waffle iron
Percolator

BREAKFAST ROOM
Vacuum cleaner
Samovar
Chafing dish
Portable heater
Combination grill
Toaster
Percolator

LAUNDRY
Washing machine
Ironing machine
No. 6 Electric Iron
No. 3 Electric Iron

BATH ROOM
Electrical vibrator
Electrical curling irons
Electrical shaving cup
Portable heater
Electrical hair dryer

BED ROOMS
Electrical sewing machine
Vacuum cleaner (for up-stairs cleaning)
Hot water cup
Heating pads
Portable heater
Wall type air heater



This beautiful two-story house in St. Francis Wood, San Francisco, is the most completely wired and electrically furnished home in the city. The wiring plans were furnished by the California Electrical Cooperative Campaign and the San Francisco jobbers have loaned the equipment that is being demonstrated in the house. Considerable advertising has been given to this remarkable plan to show the public the benefits to be derived from the use of electricity and the number of ways in which it can be used so as to completely solve the servant problem.

The house has 110 outlets and while all of the rooms are fitted with standard electrical appliances, the kitchen and laundry will be the two most interesting rooms in the house. There will be twenty-five different appliances and these will be demonstrated in action under exactly the same conditions as exist in the average household, the advantage of this being that in the demonstrations given in a store the prospective purchaser has no idea just how the appliance will work in the home.

The idea of the demonstration is to show the general public the advisability of sufficient outlets and the extent to which electrical appliances can lighten the household duties of the housewife and solve the servant problem. Following is a list of the appliances and where they will be found.

Illumination

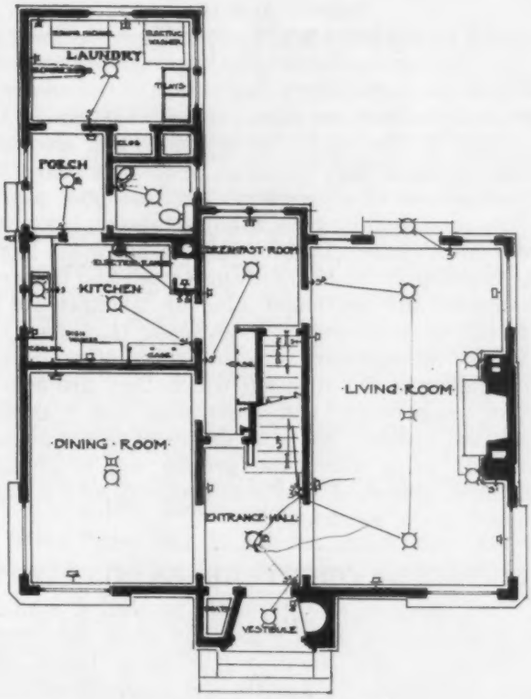
Besides the appliances noted above special attention has been paid to the illumination. The latest type of fixtures have been installed so that all of the rooms are properly lighted and have sufficient convenience outlets for floor lamps and table lamps down stairs and reading and boudoir lamps in the bed rooms.

Selling the Idea

All of the demonstrations will be given with the idea of selling the electrical home idea rather than setting forward the good points of the particular appliance demonstrated. The demonstrators will point out that the appliance in question is only one of a great number of excellent appliances, all of which differ only in minor features and accessories.

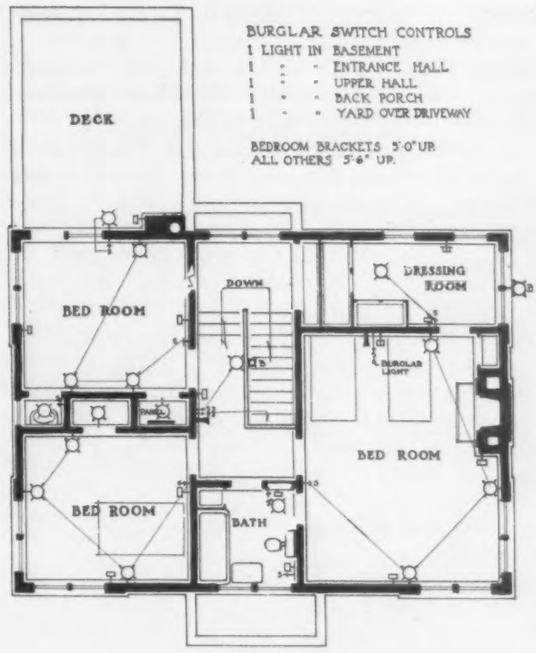
This most modern of modern homes can be characterized as 'servantless' and it is, for this reason, especially significant at a time when it is almost impossible for the family of average means to obtain satisfactory domestic help. The men of the electrical industry in San Francisco have put forth every effort to make this a perfect home and believe that it truly represents the greatest efficiency in the utilization of present day appliances.

Similar "electrical homes" are being built in Oakland, Sacramento and Los Angeles and plans are being made to have such homes built in Fresno, San Diego, Stockton and other important coast and valley towns where there is sufficient building going on to make the plan feasible.



FIRST FLOOR PLAN

First floor plan of the California Electrical Cooperative Campaign's electrical home in St. Francis Wood, San Francisco. The main features of this wiring diagram are the number of convenience outlets in the dining room, living room and breakfast room, and the complete electrical installations in the kitchen and laundry.



SECOND FLOOR PLAN

The plan of the second floor of the electrical home shows the outlets necessary for a completely equipped bed room, boudoir and bath, with the burglar alarm placed where it is most accessible. The number of convenience outlets in the bed room are for the reading lamps, warming pads, night lamps and appliances which will be wanted at the head of the bed during the light.

Cooperation With Architects and Builders

BY H. F. JACKSON

(The campaign for convenience outlets grows apace. Here is an interesting paper by the vice-president and assistant general manager of the Pacific Gas & Electric Company, delivered before a recent meeting of the San Francisco Electrical Development League, that adds emphasis to the interest that is being manifested on all sides.—The Editor.)

The greatest problem that faces us today is that of having the public understand what the electrical industry is doing for the nation, but in my opinion this understanding can only be brought about by proving to the individual of this public what the electrical industry is doing for him, what further developments in the electrical industry mean to him in dollars and cents gain, and what a delay in electrical development, due to legislative and other causes, means in dollars and cents loss to his individual business. This is practically the self-interest story as expounded by a member of this League, Mr. Emory Wishon.

In order that a proper relation may exist between architects, builders and the electrical industry cooperation in the fullest meaning of the word is essential. The use of electricity in the home has primarily been that of lighting. Good illumination properly applied is no more costly than poor lighting. It is within the reach of the vast majority, but like all good things, money alone will not suffice. Care and study are necessary. Cooperation between architects, decorators and lighting specialists is imperative to insure that proper lighting fixtures shall be available and properly applied. Good lighting touches our daily life so intimately and has such great possibilities for positive value to us that it deserves more careful consideration than it has received in the past.

Development of Appliances —

The use of electricity in the home has been greatly increased through the use of appliances until today it would be difficult to find a home that is using electricity for lighting that is not using some sort of an electrical appliance. An idea of the greatly increased demand and use of electric appliances can be gained from the somewhat startling report of the California Electrical Cooperative Campaign for the years 1918-19. Sales from eleven distributors reporting in northern California are given below.

The use of lighting outlets and sockets for the attachment of an electrical appliance should be discouraged if not altogether prohibited. Here is a rich field for cooperation between the architect, builder and home designer. Such use of a socket for the attachment of an appliance is not only unsightly and inconvenient, but it is dangerous. The burden of correcting this objectionable practice must rest with the electrical industry. The properly wired home should be fitted with convenient outlets for

every kind of electrical appliance, so that it is never necessary to unscrew a lamp from a socket in order to use an iron, toaster or heater. If a house were provided with a plug at the time of building the expense would be saved later and the use of electrical appliances would be greatly increased.

It seems perfectly obvious that the proper time to make provision for the most favorable use of appliances is during construction. This is true for a number of reasons. The ultimate cost will be less and the entire layout of the job will be more satisfactory, assuring the desired results. An installation properly designed and laid out during the construction of a building will permit the installation of the proper size wire which will prove economical to the consumer, and will avoid, to a large extent, any unreasonable drop and complaints of low voltage. The safety of the entire installation will be assured, to say nothing of avoiding the unsightliness and disfigurement of the premises that are bound to result when electrical work is installed after construction is completed.

The old saying "Every man to his trade" has considerable merit. We of the electrical industry should never presume to encroach upon the field of the architect, the builder, but cooperative helpfulness with the architect and builder on one hand and the manufacturer, jobber, central station and contractor-dealer on the other is needed. It is a difficult thing for those of us in any particular line of the electrical industry to keep in touch with the developments in other lines of that industry. How much greater must be the difficulty for those outside of the electrical industry to keep in touch with the rapid developments of the industry.

The California Electrical Cooperative Campaign and the San Francisco Electrical Development League are continually fostering cooperation between the electrical industry and members of the building industry. The latter has provided, and is providing an open forum for the discussion of all matters electrical and the former is putting into practice and operation an extensive plan of cooperation and education.

	1918		1919	
	Number	Watts	Number	Watts
Vacuum cleaners	3623	218050	7549	517790
			Increase—108%	138.3%
Chafing dishes	159	66850	294	82400
			" 85%	23.3%
Curling irons	1183	26415	1691	41682
			" 43%	57.8%
Air heaters	8407	4998600	9416	5561700
			" 12%	11.3%
Radiant heaters	4534	2710400	6359	3815400
			" 40.2%	40.7%
Disc stoves	1015	592100	1627	1593700
			" 60.3%	109%
Heating pads	3285	134650	4865	213540
			" 48%	51.49%
Percolators	3186	1281740	6480	2616300
			" 103.4%	104.1%
Toasters	3421	1619870	6743	3252750
			" 97%	100.8%
6-lb. irons	25710	13381845	31771	17784175
			" 23.5%	32.9%
Laundry irons	458	365400	984	769350
			" 115%	110.6%
Ranges	239	1888200	536	2514700
			" 124.3%	33%
Water heaters	159	468000	368	1056500
			" 131.4%	12.5%
Washing machines	2143	416600	6096	1196230
			" 184.5%	18.7%
Ironers	116	22420	278	53100
			" 140%	137%
Sewing mach. motors	1185	8875	1864	76965
			" 57.3%	76.7%

Expert Assistants

One of the most practical attempts on the part of the California Electrical Cooperative Campaign has been the furnishing of an expert to call on architects and builders in order to assist them in the designing of houses, as far as the proper electrical wiring is concerned, in order to accommodate the convenient use of all modern electrical labor saving devices, and to bring to their attention the more recent developments in things electrical for the home. This representative has nothing to sell and does not recommend any particular kind of manufacture of materials or appliances. It is hoped that such experts will be welcomed into the offices of architects and builders in the spirit in which they are sent—that of cooperation and assistance, and it is also hoped that fairness and keen desire to do the square thing will bring about the greater use of electric appliances, increased safety to property and a more economic use of electricity.

REDUCTION OF FIRES IN GENERATING UNITS

The question of adequate protection against fires in generating units was taken up at the recent convention of the Northwest Electric Light and Power Association in Seattle and recommendations made of best methods of handling the difficulty. The occurrence of fires in generating units is by no means new, but of late years the number of such cases has increased, especially in generators of the enclosed type. Due to the time required to bring the machine to a stop, fires of this character have in the past usually caused the complete destruction of the windings of both rotor and stator. A number of plans have been proposed to cope with this danger and a considerable number of installations of permanent equipment have been made in the Northwest with the idea of minimizing the extent of damage from such fires. The installation of balanced protection in each leg of the generator windings, so as to promptly disconnect the machine from the line and open the fields is becoming quite common and gives promise of being very effective as a preventative measure. To facilitate this, it is being urged upon the manufacturers to standardize the bringing out of both ends of each leg of the winding to terminal boards.

As an alternative, or an addition to balanced protection, a number of companies have installed permanent pipe connections and nozzles, so that the fire can be fought with water or steam. Carbon tetrachloride has also been suggested but has not met with much favor because of the large quantities required and the pretty well confirmed belief that it is injurious to installation. The weight of opinion and practice at this time favors water.

JOURNAL OF ELECTRICITY INDEX

The regular semi-annual index of the Journal of Electricity is now being prepared and will be published during the month of June. Copies will be sent to subscribers upon request sent to the Service Editor.

Office Records—Their Filing and Indexing

BY IRENE WARREN

(The head of a busy firm realizes the importance of properly handling back correspondence because he has learned from experience that untold trouble may come from a single misplaced letter. In this tenth article of the series, the Director of the Chicago School of Filing and Indexing discusses the most successful methods of handling back files and explains follow-up systems, both for outgoing and incoming mail.—The Editor.)

TRANSFER EQUIPMENT AND METHODS

The average firm transfers its letters once a year and sets up a new file for the coming year. The most approved method of transferring is to do it on a given date, usually the last day of the calendar year. It is never advisable to transfer merely because the folders are full. If a folder is full add another folder with the same name and divide the correspondence by dates or departments, or by whatever method is the best for serving the firm, and mark the folders accordingly.

Some firms find it better to transfer several times a year while others transfer only once in two years. The needs of the business should determine this. In highly specialized lines of business and professional lines, transfer periods are much longer; often the file is "weeded out" every five years, or a case that is completed is put in a "dead file." In lines that turn over business rapidly, the transfer is made every three or six months.

Methods of Storing

In the past, firms have tied up bundles of letters and stored them away sometimes very inadequately labeled. When letters were needed from these bundles, hours of high-paid employes' time were wasted in the effort to find them. Some firms divided the letters carefully into fairly uniform size groups and bound them in loose-leaf binders, stored on shelves. For some time, it was the vogue to place the transferred letters in pamphlet boxes which were stored on shelves. The best modern method is to use transfer cabinets which are in size and style very much like the current filing cabinet but are less expensive in construction. The adjustments in the mechanism need not be so finely made, nor the materials so good, because they are less frequently used. Firms often keep two years' transfer files in the room with the current files and the rest of the years filed in a storage room perhaps miles distant, the information given from them coming by phone, letter or messenger. The transfer files in the current filing room are in units of four drawers in height, placed on the tops of the current files and a "shoe-shop" ladder, or a platform ladder is used to get at the contents.

The Transfer Process

The transfer may be conducted in some such manner as this: Some time in the fall, the file clerk takes a pad of paper and goes through her files, writing down the labels for the new files. If there is a color scheme used, she indicates the colored labels to be written after each name listed. This list is turned over to the typist who writes the label sheets. These are pasted on the folders, and the folders sorted. Some clerks keep a card list of labels to be typed. This is revised once a year or as changes occur from day to day.

The earliest year of the transfer file is packed and sent to the store room. The drawers with contents from the succeeding years are moved into their place, in proper order. The new folders, as they are written and sorted, are filed in the drawers for the last transferred year which will be left vacant for the current year's transfer. On the 31st day of December, with the aid of the office boys, the contents of the current files are placed where the new folders now are. The new folders are placed in the current files ready for the new year. This takes careful planning, but may be done with very little delay in daily routine. In many firms, the statutes of limitations controlling the time limits for collection of indebtedness in the state where the firm is operating, determines the time when the correspondence may be destroyed.

Daily Correspondents

But there are certain correspondents from whom a firm receives letters daily and the clerk hesitates to transfer all such letters to a less accessible place on December 31st. In this case the file clerk may take the last folder for such correspondents, stamp the year very clearly in large type on the folder and leave it in the current files for a stated period of time, perhaps three months. The new folder would be filed in front of it. Hundreds of correspondents may be treated in this manner if desirable and some firms leave the entire file set up for fifteen months.

FOLLOW-UP SYSTEMS

Two distinct types of letters need to be followed-up. The first are incoming letters, and the second are outgoing letters. In either event, the man who attends to the answering of the letters indicates to the file clerk that these letters must receive further attention on a given date which he names; he then dismisses it from his mind and the file clerk is responsible for seeing that the letters are brought to his attention on the date designated. If the follow-up is merely a form letter to be sent, the file clerk may send it without further consultation.

Plan for Outgoing Mail

For those firms whose follow-up work is largely from outgoing mail, it is a good plan to make two carbon copies of the outgoing letter on different colored paper. One carbon goes into its regular place in the file and the other goes into the follow-up or tickler drawer.

In the follow-up system are guides for the twelve months in the year and supplementary guides for the thirty-one days in the month. The follow-up

carbon letter is filed back of the date on which it is to receive attention. In the early morning, the file clerk takes out the letters to be attended to that day, assembles any additional papers or information, and lays them on the employer's desk. In many concerns, the follow-up carbon copy is enough to refresh the employer's mind on the subject so he can write the customer without further data.

Follow-up systems are often so large as to take up a dozen or more drawers and miscellaneous tab folders bearing the alphabetic subdivisions are placed back of each date. The current date always stands first in the follow-up file. As letters for a given date are attended to, the date-guide is placed at the back of the file. Follow-up carbons are destroyed when the matter has been attended to.

It is never advisable to use signals in the regular correspondence files unless absolutely necessary, because they get pulled off in the hard use of a big file. But there are dated correspondence folders on the market if they are needed.

Plan for Incoming Mail

For incoming mail that needs to be followed-up, the card system is better. Each firm prints its own blanks to suit its peculiar needs. A five by three inch card is usually used which gives the name of the writer, the correspondence wanted, date of letters, and also the name of person wanting the letters and date when wanted with any additional instructions needed. These cards are filed back of month and day guides in the same manner used in the correspondence-size file just described. The file clerk each morning has to get out of the file the letters needed according to the instructions given on the follow-up card. The follow-up card is usually attached to the correspondence sent to the employer to show directions have been carried out. Cards for repair work are often filed in similar style by date.

Cooperation in the Electrical Industry

(The following is an extract from the report of the N. E. L. A. Committee on Cooperation in the Industry, presented at the N. E. L. A. Pasadena convention. The members of this committee are: Chairman, Lee H. Newbert; vice-chairman, Robert Sibley; D. R. Bullen, A. P. Denton, John J. Gibson, R. S. Hale, N. W. Low, Wm. Creighton Peet, E. W. Rockafellow, and M. S. Seelman.—The Editor.)

"The Society for Electrical Development has achieved and promoted cooperation by means of its staff and by means of the work which it has incited its members and others to undertake and accomplish. The Jovian Order is intended to promote cooperation and in many instances its existence and its work have been of service to our industry. The National Association of Electrical Contractors and Dealers has worked out carefully a very complete and excellent plan for promoting cooperation, a plan which in some ways is quite similar to the California plan. The Commercial Section of our Association, working through its various bureaus and committees, has accomplished much and is planning to accomplish more. In addition to these four national movements, much cooperative promotion work has been done by the National Electrical Supply Jobbers' Association, the Conference Club, the various manufacturers' associations and others both nationally and locally.

"The primary object of the work of the California Electrical Cooperative Campaign has been to harmonize the various interests so that there would be unity of action. Practical cooperation means doing the other fellow's way if you can not get him to do your own way. Today, after nearly three years of consistent and conscientious effort under the inspiration of the cooperative idea, in California these ideals have become facts. Let us then briefly see how this wonderful change has been brought about.

1.—The Field men have visited and worked in various towns throughout the state as directed by the committee, and have made regular reports direct to the committee at headquarters as to results. They have proven tactful, flexible and of the highest service in meeting specific inharmonies that have arisen either between various branches of the industry or among individuals of the industry, or between the industry and the public.

2.—The Field men have arranged joint meetings of all electrical men for general discussions of their common interests and problems. The Advisory Committee has furnished suitable speakers for such meetings. Forceful instances of these meetings are recorded in the Technical Press of 1918-19, wherein groups of men, four hundred in number, have met in banquet assembly in San Francisco and similar groups in Los Angeles from time to time. These men have represented all branches of the industry, members of the Public Service Commission and other prominent and influential citizens. Not only in the larger cities have such meetings been held, but in Sacramento, Fresno, Chico and Oakland, California, similar gatherings have taken place to spread the gospel of cooperation and helpfulness throughout the industry.

3.—The Field men, under the direction of the Advisory Committee, have brought the Central Station managers and employes to closer cooperation with the contractor-dealers.

4.—They have promoted better acquaintances between Central Station employes and dealer-contractors.

5.—The Central Station manager has as a result indicated to his organization and employes that it is his company's policy to support this cooperative campaign.

6.—The greater portion of the Field men's time in the town, however, has been spent with the dealers and contractors in assisting them in their efforts to improve their business methods, including accounting, sales, advertising and general store appearance, and also to secure their closer cooperation with the central station in their town.

7.—They have shown to the dealer-contractor the advantage of the retail end of his business and thereby encourage the dealer-contractor to give more attention to this important phase of his work.

8.—They have brought to their attention good merchandising methods.

9.—They have encouraged the proper arrangement of stores and show windows, particularly by showing photographs of well arranged stores and windows, and by assisting the dealer-contractor with his plans for improved arrangements.

10.—They have emphasized the advantage of tying in with national publicity campaigns and with central station advertising campaigns.

11.—The dealer has been encouraged to use good advertising material furnished by manufacturers.

12.—The dealer-contractor has been encouraged to adopt proper accounting methods, so that today California contractor-dealers have installed more of the national standard accounting systems than anywhere else in the nation.

13.—The Field men have shown to non-member dealer-contractors the advantage of membership in the California Association of Electrical Contractors and Dealers, as well as the National Association of Contractor-Dealers and the National Electric Light Association.

14.—The contractors have been encouraged to use high quality of material and workmanship and standard practice methods of estimating cost of installations.

15—The Field men have convinced the contractor-dealers of the advantage of a closer cooperation with the central station and central station employes.

16.—They have caused the contractor-dealer to realize the necessity of giving prompt attention to work which they are assigned to do so that there would be little need for complaint either from the Central Station or customer due to the growing activities of the electrical contractor-dealer field of activity formerly covered by the Central Station.

17.—Architects, homebuilders and contractors have been urged to install sufficient outlets for the convenient use of all electric appliances, thus initiating a movement in the industry that today is assuming nation-wide proportions.

"There is no better evidence of the growing appreciation of this work than the increased cheerfulness and willingness with which subscriptions have been made for this activity. The work done during 1918 warranted its continuance, and a larger fund

was secured in 1919. Indeed, so enthusiastic have the contributors become in the efficacy of this splendid educative work in California that the fund subscribed annually has grown from $12,400 in 1918, to $18,000 in 1919, and to $27,000 in 1920. The widespread interest in the work of the campaign was manifested by the number of new subscribers, among which, in addition to those representing the four branches of the industry, was the Technical Press, which also contributed much valuable publicity.

Concrete Results

"We emphasize the value of such a movement and the actual concrete results in tangible values. While discord formerly prevailed, harmony is now in our industry. While chaos in stores was formerly common, businesslike establishments are today found on every hand and from a canvass of sales made in California, the result shows that 62% more sales were made in appliances during 1919 than in 1918, in spite of the fact that California even hitherto had boasted a saturation of electrical uses prevailing to a degree per capita nowhere else in the nation, and furthermore, in spite of the fact that the average selling prices had been increased fully 50%.

"For a single organization to attempt to dictate or control cooperative efforts would be inadvisable. While the records show that the actual vote for organization of this important cooperative work in California took place at the Riverside convention of the Pacific Coast Section of the National Electric Light Association in 1917, your Committee feels that it would be an injustice to leave unrecorded the fact that the success of the movement in California was achieved not only through the fatherly influence of the Central Stations acting through the executive committee of the Pacific Coast Section of the National Electric Light Association from time to time, but equally through the activities of the California Association of Electrical Contractors and Dealers, the Pacific Division of the Electrical Supply Jobbers' Association and a helpful group of electrical manufacturers who in spite of their respective organizations were contemporaneously and harmoniously working at all times to align every element of our industry in California with this movement which has in the past three years accomplished such marked achievements.

"And finally, the Committee is of the opinion that to obtain the best results, two things are needed, the first being local organizations by states or groups of states as may best suit local conditions to carry on active field work, and secondly, national coordination and cooperation."

Electricity in Pierce County Coal Mines

BY E. J. BARRY

(The coal mining operators of the state of Washington have found it much to their advantage to market all of the coal they produce, thus operating the mine entirely on power purchased from the power company. In the following article an electrical engineer of the Wilkeson Coal and Coke Company tells the story of how this Washington coal mine was made electrical throughout and how it set the pace for coal mine electrification throughout the vicinity.—The Editor.)

At the beginning of the year 1915 the Wilkeson Coal & Coke Company, with mines located at Wilkeson, Washington, realized that since all the surface coal that could be reached from the mine tunnel had been taken out, the only alternative to closing the mine lay in sinking a slope or shaft and going after the coal on another level. The mouth of the slope was approximately 8,000 feet in from the mine entrance so a steam line was out of the question. It was then decided to operate the hoist for getting out the coal by electric power purchased from the Puget Sound Power and Light Company, this company agreeing to run a transmission line to Wilkeson and locate a substation near the mine.

It was decided to bring the power in the entire distance of 8,000 feet by cable. A 4/0 three conductor, steel tape armored, and jute wrapped, rubber insulated cable, suitable for a working pressure of 2300 volts, was selected.

After considerable difficulty the 8,000 ft. of cable was put in position ready for the cable splicers. The slope hoist was driven by a 225-hp., 2300-volt, 600 r.p.m. motor with automatic contactor panel, operated by a master controller. There was also installed close to the hoist a 12 by 14 air compressor driven by a 75-hp. motor also of 2300 volts. This compressor supplied air to use on rock drills.

Power was turned on three days later and with but two interruptions due to damaged cable has continued ever since. A 1000-gallon per minute pump operating against a 660-ft. bend and driven by a 250-hp. motor has since been installed on the lower slope. Lighting is taken in the hoist room and down the slope from a 5-kw., 2200/110-volt transformer and this comprises the extent of the electrification inside the mine proper.

Formation of Coal Seams in Washington

It is sometimes asked, why cannot coal be mined electrically in Washington as in the East, where coal-cutting machinery is practically universal. The answer is that the seams of coal in Washington run at an angle like one side of an inverted V and therefore cannot be reached with a straight bar cutting machine.

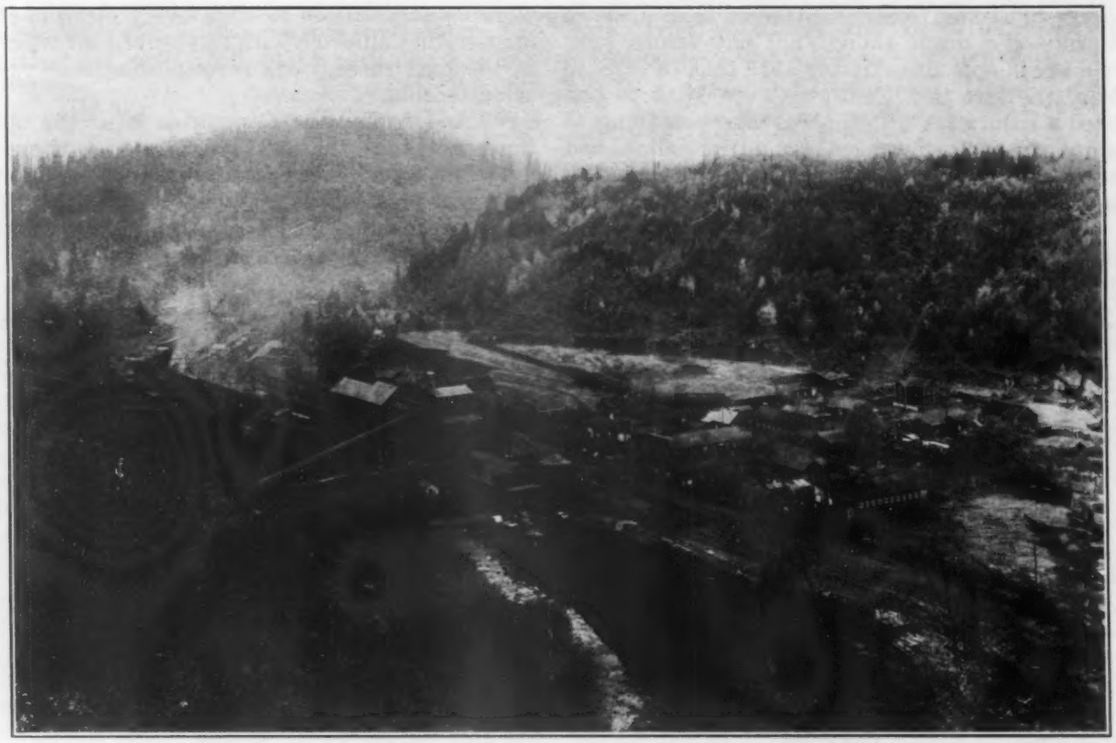
The practice in Washington is to run tunnels underneath the coal seams and tap seams into coal cars below. The seams will often cascade into the cars without any assistance on the part of the miner, but more often a powder charge is necessary to dislodge the coal.

Haulage in the Mine

As before mentioned steam locomotives are still used to haul coal in the main tunnel, although stor-

age battery electric locomotives are used to bring cars from the working face to the main tunnel. The question of electric haulage, due to curves and grades in the main tunnel, is quite a problem. The steam locomotives, due to smoke and heat are a nuisance, storage batteries are out of the question due to grades and curves, and owing to continual settling of the roof and breakage of timbers a trolley wire could not be made to stay in working order more than a few hours, and the danger of shock from the naked wire is quite serious, especially as most of the mines are thoroughly water soaked.

It was the intention of the Wilkeson Coal & Coke Company at first to use electricity for the interior of the mine only, leaving the bunkers steam-driven as before, but shortly after the successful inauguration of an electric drive there, the main engine driving the bunkers ran away, the flywheel burst, scattering destruction around, and three minutes later what had been a very fair sample of the old time mine engine room was a heap of junk. A piece of the bursting flywheel on No. 1 engine flipped the governor off No. 2, and No. 2 also ran away.



General view of the coal bunkers of the Wilkeson Coal and Coke Company of Wilkeson, Washington, showing the steam plant which has been closed down since the installation of electrical equipment throughout the mine.

Installation of Electricity Throughout

This incident brought about the installation of electrical equipment throughout the mine, and so thoroughly has this been carried out that even the mine siren is operated electrically at present.

The starting effort on coal handling machinery, especially in cold weather, is very heavy. The coal has to be washed and naturally the washer freezes on winter nights when the bunkers are shut down. Therefore wound secondary motors were employed to make possible starting up machines on cold mornings. A 100-hp., 2300-volt, 3-phase, 60-cycle, wound secondary motor was used to operate the bunkers and a similar size and type to operate the washers. Controls for both these motors were placed on the platform where convenient to the bunker foreman, the motors taking the place of the engines in the old engine room. A 35-hp., 440-volt crane type motor hauls the loaded car to the top of the bunker, where the coal is dumped. This is a balanced load, the empty car going down assisting the loaded car up the 40 degree slope. A 25-hp. crane type motor hauls the rock car out to the rock dump where refuse rock is disposed of.

A 100-kw. motor generator set wound for 110 volts provides direct current for charging storage batteries for electric locomotives and electric mine lamps, and also operates an electrically driven coke puller. This latter machine deserves some mention as it performs work that is becoming increasingly difficult to get men to do.

Operation of Coke Ovens

The Wilkeson Coal & Coke Company has 160 beehive coke ovens into which coal from the mine is poured through an inlet in the roof of the oven. Fire is then started and slow combustion begins, continuing for about 48 hours, when the coke is ready to be pulled. In the old style method a husky individual with a long steel rake appeared, and removing the clay sealed door of the oven began to rake out the glowing coke. It was hot and back-breaking work, made worse by the clouds of fine dust thrown off the coke as it fell to the ground in front of the oven.

The coke was then laboriously shoveled into wheelbarrows and trundled into the railroad cars waiting near by. The electrically driven coke puller does the work of thirty men.

The coke puller runs on a track in front of the ovens and can be stopped at any point. It is equipped with a long steel arm on a rack and pinion which drives into a mass of coke and rakes it out to a moving conveyor which forms part of the machine. This conveyor loads directly into the coke carrier on the railroad spur, loading a car in one-tenth the time taken by the old method.

Power is conveyed to the mechanical conveyor by overhead trolley, return being made through a bonded rail. A motor driven coke hauler has displaced the old and faithful mule that hauled the coal to be dumped into the ovens. Electricity has displaced human and brute labor wherever it was feasible to do so, and the mine management has never regretted the change in the years of operation since it was made. A 100-hp. motor driving the fan supplies pure air to the mine workings.

One matter instantly appreciated by the management was the decidedly greater freedom from breakdowns with electric drive as compared with steam. Conveyor chain breaks had come to be looked on as a necessary evil under the old system, and rarely a day passed without a shut-down of from one to two hours due to this cause. With the steadier electric drive this trouble disappeared almost entirely, much to the joy of those concerned. The varying engine speeds had been responsible for most of the mishaps in the past.

Energy is taken to the coal company's 4-panel switchboard from the 2300-volt lines of the Puget Sound Power and Light Company and thence distributed to the mine, bunkers, fan, etc. There is a total connected load of 1120 horsepower, mostly in large units.

Motors over 35 hp. are all wound for 2200 volts working pressure and although some fear was expressed that this would be a dangerous voltage to use in a coal mine, five years of operating experience has demonstrated to the contrary.

Economy of Using Electricity

Coal at a coal mine is always thought to be a cheap commodity and such economy in fuel consumption as might be attained by covering long steam lines is unthought of. The coal that one time was carelessly shoveled into furnace fires at the mines of the Wilkeson Coal & Coke Company is now sold, bringing a good price in the open market. The labor that did the shoveling is now better employed in getting out more coal. From these two items alone the saving in the use of electricity over steam is placed at a conservative estimate at $60.00 per day. Therefore in a working year the net gain in favor of electricity from these items alone is $18,000—this item after all incidental charges of interest, depreciation, and cost of purchased power have been deducted. The management is very whole-hearted in their appreciation of the advantages and economies of electric drive, and their example encouraged many other mining companies in the vicinity to follow suit, with the result that now practically every mine of standing uses electric drive.

The electrically operated coke puller which runs in front of the coke ovens of the Wilkeson Coal and Coke Company. This machine does the work which before required thirty men. This conveyor loads directly into the coke carrier on the railroad spur, loading a car in one-tenth the time taken by the old method.

A New Theory of Matter

BY A. C. CREHORE, PH.D.

(In eleven previous discussions the author, one of our most noted present day physicists, has laid the thorough foundation work for this final and conclusive chapter on his New Theory of Matter. The electron revolving in a circular orbit, and the mechanical forces that result are here taken up in an interesting and convincing manner, which should serve to offer new and conclusive proofs concerning the necessity for establishing new theories of matter than those which have formerly been thought to be sufficient.—The Editor.)

In several places in the foregoing sections reference has been made to the author's theory of the atom. A brief account only of this theory will be given in this section, and for a more detailed description the reader is referred to the author's book "The Atom." Use is made of electromagnetic theory in part and also of the Einstein equation connecting energy and frequency by a constant ratio, namely Planck's constant, which has been referred to above.

The Electron in a Circular Orbit

When an electron revolves in a circular orbit, as it is supposed to in the normal undisturbed state of all atoms, it exerts a certain mechanical force upon the stationary nucleus of an atom at a great distance away. It may be shown by means of the Lorentz form of electromagnetic theory that the mechanical force thus exerted by the revolving electron upon the distant atomic nucleus, due to its motion alone, is a circular force, provided the plane of the orbit of the revolving electron is perpendicular to the line joining the centers of the stationary nucleus with the center of the orbit. That is to say, this mechanical force may be represented by a vector having a constant magnitude but revolving at a uniform rate around the stationary nucleus as a center. It may thus be represented by an imaginary circle with the nucleus as a center, the plane of the circle being parallel to that of the orbit of the distant revolving electron, and the frequency of the revolving force the same as that of the revolving electron.

Moreover, this mechanical force is proportional to and in the opposite direction to the acceleration of the revolving electron. When an electron revolves in a circular orbit at a uniform rate the acceleration of it has a value constant in magnitude only, but continually changing in direction, since it must always be directed towards the center of the circle in which the revolution takes place. The acceleration of the electron may then be represented by a vector having the opposite direction to the position of the electron itself, namely the position vector. Both vectors, the position vector and the acceleration vector, always remain in opposite directions as they each revolve at the same rate, and thus describe circular paths. The direction of the force exerted upon the distant atomic nucleus is therefore in the same direction as the position vector, and opposite to that of the acceleration.

When the Orbit is Perpendicular to the Line of Centers

If, now the plane of the orbit of the revolving electron is turned so that it does not occupy a plane perpendicular to the line referred to joining centers, then the electromagnetic theory tells us that the mechanical force exerted upon the distant stationary nucleus is proportional to that portion only of the acceleration which is resolved in the plane perpendicular to the line of centers, and that it is always confined to a plane perpendicular to this line. Or, in other words, the plane in which the mechanical force is exerted is invariable, always being in a plane perpendicular to the line of centers, even though the plane of the orbit is not. And, again, the component of the acceleration of the revolving electron which is in the direction of the line of centers has no effect in producing any force upon the stationary nucleus.

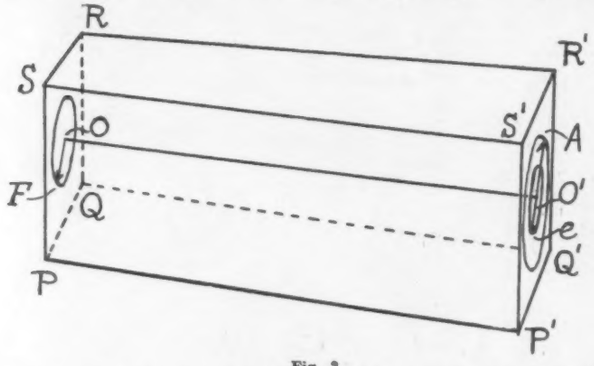


Fig. 2

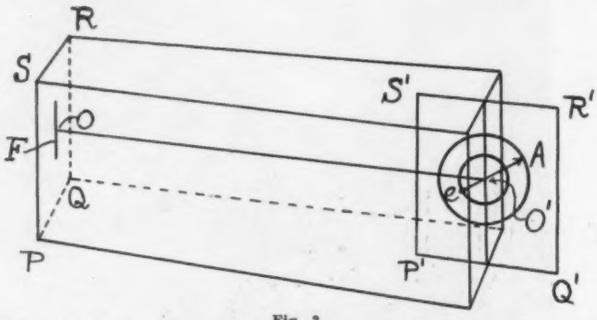


Fig. 3

The box-like framework is used to assist the eye in locating the geometrical objects in space. O represents the position of the fixed atomic nucleus and e, the instantaneous position of this revolving electron in the hydrogen atom. The circular orbit which is describes is represented in perspective about the fixed center O′.

These statements may be easier to comprehend by reference to Figs. 2 and 3. Let O be the position of the fixed atomic nucleus, say that of an atom in the photographic plate receiving the radiated energy from an electron in the distant hydrogen gas. Let e represent the instantaneous position of this revolving electron in the hydrogen atom describing a circular orbit represented in perspective in the figure about the fixed center, O′. To render the positions of these fixed points and planes referred to more

apparent, use is made of a sort of box framework which is for no other purpose than to assist the eye in locating these geometrical objects in space by means of a figure drawn in a plane.

The fixed nucleus is located in the center of the plane PQRS at the left end of the box. The orbit of the revolving electron is shown by the small ellipse, as representing a circle in perspective on the right end of the box in the plane P′Q′R′S′, which is parallel to PQRS, about the center O′. These two planes are each perpendicular to the line OO′ joining centers. The acceleration of the revolving electron is then represented by the revolving vector O′A, which has the opposite direction to the position vector O′e. In this case the mechanical force exerted by the electron e upon the stationary nucleus O is represented by a circle in the plane PQRS about O as center, and the instantaneous position of the force vector, OF, is opposite to the acceleration O′A, and the same as the position vector O′e.

If, now, the plane P′Q′R′S′ is turned around through a right angle, as represented in Fig. 3, carrying with it the orbit of the revolving electron, e, then the mechanical force exerted by it upon the stationary nucleus at O is still in the same plane, PQRS, but it is not now represented by a circle but by a vertical straight line in this plane. The instantaneous position of the force vector is OF, which describes a harmonic motion up and down this vertical line. For any position of the plane P′Q′R′S′ intermediate between the parallel position as in Fig. 2 and the perpendicular position as in Fig. 3, the force-vector still remains in the same plane, PQRS, but is then represented by an elliptical motion in this plane about O as center, the circle in the first instance and the straight line in the second being but particular cases, the limiting cases, of elliptical motion.

As Viewed from the Stationary Nucleus

If we should view the orbit of the revolving electron from the stationary nucleus, it would appear as an ellipse in general when the orbit is not perpendicular to the line of centers. This ellipse represents the path of the position vector of the electron resolved in a plane perpendicular to the line of centers. Similarly, the circle representing the acceleration of the electron would appear as an ellipse when viewed from the same point, and this ellipse represents the resolved portion of the acceleration in a plane perpendicular to the line of centers. The mechanical force upon the distant nucleus is proportional to this resolved portion of the acceleration but in the opposite direction, and, hence, the mechanical force exerted upon the nucleus is an elliptical force, still, however, being in a plane perpendicular to the line of centers.

These ideas may be applied to obtain the effect of several electrons simultaneously acting upon the same stationary nucleus. If it is supposed that the selected stationary nucleus represents just one typical atom, say, in a photographic plate receiving the radiated energy from a distant mass of gas confined in a vacuum tube, then it may be supposed that the record produced upon the plate after development will depend entirely upon the radiated energy received by the atomic nuclei of the plate, and that what is received by one atom is also received by another. It is also to be inferred that the energy received by each nucleus is directly related to the mechanical force acting upon the nucleus during the reception of the radiated energy, but this, as we have shown, depends upon and is proportional to the acceleration of the revolving electron in the distant gas. The total force upon the nucleus is proportional to the total vector sum of the accelerations of all of the revolving electrons in the mass of gas resolved in the plane referred to, whose radiated energy reaches the photographic plate and the stationary nucleus of an atom in the plate.

An Example in the Hydrogen Atom

Assuming that there are two electrons in the normal state of each hydrogen atom situated at the opposite ends of a common diameter, the sum of the accelerations of the two electrons in one atom is evidently zero, for each is represented by a revolving vector of equal magnitude and opposite direction to that of the other, the geometrical sum of the two vectors being zero. If this is true of one atom it is true of them all. Hence, it follows that the mechanical force exerted upon the distant stationary nucleus in the photographic plate is zero for each hydrogen atom independently, and therefore, is totally equal to zero. The plate will show nothing upon development after exposure to a mass of hydrogen gas in its normal condition. This is in entire agreement with the observed facts, and this also explains in a satisfactory manner why the total radiation from a normal mass of hydrogen gas is zero.

It is not so easy to explain this matter if we should assume that each hydrogen atom has but a single electron in accordance with the Bohr theory of the atom. In such a case the force due to each atom independently would not be zero, and whether the total force due to a multitude of such atoms in a mass of hydrogen gas is completely zero or not must depend upon the statistical question how completely the forces due to different atoms annul each other on the average. The chances that they will annul each other seem to be considerably greater if it could be assumed that the radii of the orbits of the electron in every atom is the same, and that the frequencies of revolution are also the same in every atom. But, the Bohr theory of the atom does not make these radii and these frequencies the same, and the probability that there will be a complete cancellation of the resulting force upon the stationary nucleus is thereby made far more improbable than it would otherwise be.

No attempt has been made to solve this statistical problem so as to show that the radiation from the Bohr hydrogen gas should be zero according to electromagnetic theory, because the matter has lost its interest. The two electron atom fills all the requirements perfectly not only in this respect but in every other respect that has been presented.

Extension of Theorem by Fourier's Analysis to Any Form of Motion of Electrons

It may now be shown that the theorem above mentioned as to the mechanical force due to a revolving electron upon the stationary nucleus of the distant atom is perfectly true according to electromagnetic theory for any kind of motion of the revolving electron, whether it follows a circular path or not. That is to say, the theory shows that the mechanical force is proportional to the resolved acceleration no matter what its character may be. A little reflection will show that this is a direct result of the theorem as established for simple circular motion. Suppose, for example, that two independent circular motions are geometrically added together. They may each have different radii and periods. The resulting curve may be considered to represent the complex path followed by the electron in question. The resulting mechanical force due to an electron thus moving would be the same as if two electrons were revolving in circular orbits of the radii and frequencies above mentioned, and, since each of these two component forces is proportional to the resolved acceleration of the electrons respectively, the resulting force is just the same as if the single electron moved in the curve compounded of the two circular motions.

Now, any motion of an electron whatever represents a certain acceleration, and any acceleration whatever may be resolved into an infinite series of simple circular accelerations according to Fourier's well-known theorem. Each of these component circular accelerations contributes its proportional mechanical force upon the distant stationary nucleus, and the total force is proportional to the sum of the component accelerations resolved in the perpendicular plane. The sum of the component accelerations is again equal to the actual acceleration in any complex path whatever that the electron may follow. The total mechanical force is then proportional to the actual resolved acceleration.

Observation by Means of the Photographic Plate

The next step in the process of arriving at an atomic theory is to go to the photographic plate to observe what effect is produced upon it when the hydrogen gas is not in its normal condition, but when it is caused to radiate energy due to being bombarded by electrons from some external source. By the use of a diffraction grating or of a prism it is possible to sort out, as it were, the component frequencies that exist in the radiated energy, and to obtain an exact measure of these frequencies. The result which has been experimentally obtained from hydrogen is that the energy radiated is always emitted at some definite frequency, and that no other frequencies have ever been observed by the use of hydrogen gas than those expressed by the simple mathematical formula

$$\nu = K\left(\frac{1}{\tau_2^2} - \frac{1}{\tau_1^2}\right).$$

In this formula K represents the important Rydberg's constant, which has been discussed in the foregoing sections. It not only appears when hydrogen is employed but also when other elements are used, but in a different way in each case. The ν represents the frequency of the received energy, and the τ_2 and τ_1 stand for integers, 1, 2, 3, etc. Any values of τ_2 and τ_1 may be substituted in the formula, and the resulting frequency calculated will be found to be emitted by the hydrogen gas under the proper conditions. The only restriction is that those values of these integers which make the frequency come out with a negative sign are prohibited, no meaning being attached to a negative frequency. Moreover, no other frequencies than those given by this formula are ever observed by the use of hydrogen.

It may be inferred immediately from these facts that the force acting upon the selected stationary nucleus of an atom in the plate always has the same frequencies, and then, by means of the theorem just given, that the sum of the resolved accelerations of the electrons in the hydrogen gas emitting the radiation contains these frequencies and no others. This gives the first intimation regarding the component frequencies in the acceleration of the motion of the electrons of the gas that we have possessed. But, because it is merely a sum of the effects due to a multitude of atoms, it is not as satisfactory as if it told something about the acceleration of an individual electron.

Frequencies Emitted by Hydrogen

It shows, however, that it is possible that the frequencies emitted by hydrogen are due entirely to the character of the motion of the electrons in the gas, that is to say, to the form of the orbits followed by the electrons, when disturbed and compelled to depart from their normal circular motion. It is well known that, as soon as the cause of the disturbance is removed, the electrons quickly return to their normal condition again and cease to radiate energy. What happens to an individual atom may be pictured by imagining that the electrons are driven out from their circular orbits, one of them going out to some maximum distance from the nucleus, and then returning again after the disturbance is over. The paths, by which these electrons return to their original orbit, cannot possibly be simple circular paths, and, unless the paths are circular, their accelerations cannot possibly be simple circular accelerations. Any other form of path demands more than one simple circular acceleration, which is the same as saying that these quasi spiral paths demand more than one frequency of vibration. And, again, since the motion ends finally in the original circular orbit from which it started, the case of a single atom demands that a series of frequencies shall be emitted at once in one operation of the two electrons, and that the frequency shall gradually fade away and become zero when the final orbit is attained. For, in this orbit the radiation has no frequency. As the periods of the two electrons approach equality in attaining this orbit, their difference, or vector sum, becomes less and less until it vanishes altogether.

It is possible to write the equation above given for the frequencies emitted by the hydrogen gas as follows:

$$\nu = K\left(\frac{1}{\tau^2} - \frac{1}{(\tau+\tau_2)^2}\right).$$

This form is exactly equivalent to that previously given, in that it gives every line of the hydrogen spectrum just as the former did, but there is a difference between the two forms in the succession of lines obtained by fixing the value of τ_2 and giving to τ_1 in the first formula, or to τ in the second form, a succession of integral values. In the second form the frequencies obtained evidently fade away for increasing values of τ finally to zero, no matter what value is assigned to τ_2. This is evident because $1/\tau^2$ and $1/(\tau+\tau_2)^2$ tend to equality the larger τ becomes, and their difference tends towards zero. In the original form the frequencies tend to increase to a "head" value as we increase τ_1, letting τ_2 remain fixed.

The author's theory is that an infinite series of frequencies is emitted by the two electrons in one atom as they are returning to their original orbit after being disturbed, and that these frequencies correspond exactly to those in the second equation just given, when τ_2 has some fixed value. On a different occasion τ_2 may have a different value and the electrons go out to a different distance from the nucleus, and give a different series of frequencies on returning. A multitude of atoms will thus give all of the lines observed in the spectrum of hydrogen.

Differences Between the Author's Theory and Bohr's Theory

The difference between this theory and the Bohr theory alluded to is that the Bohr theory assumes that one single vibration frequency only is emitted in one operation of an electron, in changing over from a circular orbit of a larger radius to a circular orbit of a smaller radius. It is impossible under this hypothesis that these frequencies should be due to the orbital motion of the electron, for, the path in changing over from one orbit to another cannot possibly be a simple circular path, and the acceleration cannot, therefore, have a single harmonic frequency as supposed. The Bohr theory offers no explanation whatever of the source of these vibrations, and leaves the matter surrounded in mystery.

By making certain reasonable assumptions concerning the accelerations of the two electrons in the hydrogen atom, the author has worked out possible forms of the orbits described by the two electrons in returning to their original orbit, such that the sum of the accelerations of the two contains only those frequencies of vibration that are contained in a single one of the series of frequencies contained in the second form of frequency equation above given, when τ_2 has one fixed value. The form of path and the rate of motion of the electrons along it gives a complete explanation of the production of these observed frequencies, and no others.

The Einstein Equation as a Check

By treating the case by the principle of the conservation of energy, and by the use of the Einstein equation above referred to, it has been possible to arrive at an expression for the energy required to pull the electrons completely away from the nucleus of the hydrogen atom, and from this to obtain numerical values of the so-called ionizing voltages for hydrogen. For a more complete treatment of this phase of the subject the reader is referred to the book, "The Atom." It can merely be stated here that the ionizing voltages thus obtained for hydrogen are as follows:

τ_2	Ionizing voltage
1	15.496
2	13.806
3	13.055
4	12.631
5	12.361
6	12.172
7	12.034
8	11.927
9	11.845
10	11.776
....	.....
∞	11.132

It is considered that these results are in remarkably close agreement with the experimental values of these voltages for hydrogen. It has been observed that ionization sets in at about 11 volts, and a trifle over. This corresponds to the value of $\tau_2 = \infty$ in the above table, and this is the minimum value. Nothing whatever is observed to happen in hydrogen until this voltage is reached. A new type of ionization has also been observed at about 15.8 volts by Davis and Goucher. This is very close to the upper limit, or maximum value in the table corresponding to $\tau_2 = 1$. A distinctive point has also been observed at about 13.6 volts, which corresponds to $\tau_2 = 2$ in the table.

The other intermediate values just above 11.132 volts are so close together that it would not be possible to distinguish the individual voltages called for corresponding to large values of τ_2, because the experimental data merges these humps into a smooth curve. The ionization is shown by the table to be nearly continuous after 11.132 volts is reached until we come to the small values of τ_2 near the top of the column.

It ought to be stated that the Bohr theory of the atom gives a maximum ionizing voltage of about 13.54 volts, which is not in agreement with the experimental facts. It is considered that the obtaining of numerical values of these voltages in close agreement with observations from the new theory of the atom is strong support for the ideas lying back of the theory.

THE SOLAR LIGHT AND POWER PLANT

The underlying principle of the solar light and power house is the drawing of heat from the sun's rays into a moving sheet of water, which passes up and down through a series of zigzag passageways under a double thickness of glass. The sun raises the temperature of the water to 150 degrees. The heated water passes into a sulphur dioxide boiler and this water later returns to the glass heating tanks. The heated water at a temperature of 150 degrees or more runs off through a pipe into a storage tank, insulated with layers of dry sand. At a plant of this sort which has been installed in Arizona the water remained hot from four to ten days when stored in this tank.

SPARKS—Current Facts, Figures and Fancy

(Items which predict great speed increases in airplane and railway travel appear on this page along with condensed information concerning the energizing of farms by electricity, the latest and largest elevator system and the present status of foreign currency.—The Editor.)

Among European countries Norway ranks first in water power wealth. She has given unusual attention to the use of water power and was able to face with ease the great shortage of coal brought about by war conditions.

* * *

It is estimated that two and a half billion dollars must be spent in the next three years for railroad improvement. This fact is of especial interest to the electrical industry since there is reason to believe that a considerable part of the tremendous sum will be devoted to electrification.

* * *

Canada probably has in use a greater proportion of aluminum transmission lines than any other country. A recent survey by the Commission of Conservation shows that on all lines in the Dominion operating at 10,000 volts or over, there are 13,000 wire-miles of aluminum and 8,000 wire-miles of copper.

* * *

One hundred and sixty miles per hour is considered pretty good speed by most people today, but this pace will undoubtedly be a bit too slow for practical purposes in the days to come. The president of the French Aero Club states that the recent invention of a turbine motor promises an airplane speed of 250 miles per hour within a few years.

* * *

The electric railway has extended even to easy-going old Madrid. The new subway opened there recently is equipped with metal coaches carrying two motors of 175 hp. each. The cars are divided into first and second classes, and a motorman and conductor comprise the crew for each "train," consisting of one motor car and one trailer.

* * *

When one reads of the latest largest elevator system in the world, one realizes that the elevator boy will soon be a thing of the past. This largest system in the world is the installation of 96 "operatorless" elevators at the Brooklyn Army Supply base. These are set in banks of ten—each bank being handled by a central dispatcher instead of ten individual operators. On these elevators is a "micro" leveling equipment which automatically controls the floor leveling of the car to the extent that each elevator is brought within a quarter of an inch of the floor level without the attendance of an operator or guard.

* * *

In view of recent discoveries it appears that the farmer will soon use as much or more electricity than any other production factor in this country. A practical and inexpensive method of transmitting electrical power from main transmission lines direct to the farms is being perfected. In this way it will be practical to serve all farms for 50 miles on each side of the main power line. The energizing of farms by electricity is strongly advocated, since science proves that this would increase the productivity at least 25 per cent. By means of wires stretched across the fields the fields can be energized at night when other power demands are negligible. It is predicted that it might be possible with electrical energizing to grow two crops in one year.

* * *

We in America are apt to grumble over the small amount the dollar will buy, but it is well in this connection to consider the currency depreciation in some of the countries of central and eastern Europe. Based on recent market quotations the depreciations showed as follows: Austria, 97.53%; Hungary, 97.58%; Germany, 92.38%; Greece, 43.26%; Rumania, 91.81%; Poland, 97.98%; Czecho-Slovakia, 92.76%. This means that if these various peoples were to buy materials in America at the present market value of their currencies, Austria and Hungary would have to pay forty times the normal cost, Germany thirteen times, Greece twice, Rumania twelve times, Poland (Cracow) fifty times, and Czecho-Slovakia fourteen times the normal cost. Their currencies are depreciated because they have neither gold nor sufficient production with which to maintain their normal position either with the United States or with their own immediate neighbors.

* * *

Those who feel that they do not care to leave terra firma even for the purpose of gaining time through the patronage of airplane transportation are glad to learn of the recent invention of the electric monorail car, which is reputed to be the fastest method of transportation. It is perfectly plausible that cars placed on a single line of wheels will run much faster than if placed on a double rail as at present, and it further follows that if a car or locomotive can be made to run on a single rail in a normal, stable and upright position, it must necessarily travel faster than the ordinary trains, at the same time using an equal amount of fuel or electricity. Two methods of applying the monorail system have been proposed. Electric current for propelling the cars may be taken from a trolley wire or a third rail, and the current returned through the center monorail on which the cars run. The cars may be propelled, either by having an electric motor or motors drive large friction wheels which protrude through openings in the side of the car, so as to buck against flat friction rails on the side of the trough through which the cars run, or else they may be operated by gear wheels protruding from the sides of the cars, which gears may mesh or engage two toothed racks placed along the sides of the conduit.

PERSONALS

L. H. Newbert, manager of the commercial department of the Pacific Gas & Electric Company, with headquarters at San Francisco, has been elected president of the Pacific Coast Section, N. E. L. A. Mr. Newbert has long been a forceful factor in the electrical industry in the West. In the early days of the Pacific Gas & Electric Company, back in 1900, he was engaged in the activities of this company in and about Marysville, California. His business ability was early recognized and he was transferred to San Francisco to take charge of the sales department. Later when the commercial department and the sales department were amalgamated he became the head of the commercial department, which position he at this time occupies. In the work of the California Electrical Cooperative Campaign, Mr. Newbert has been chairman of the Advisory Committee since its beginning, and has at all times been the steadying hand that has guided this institution to its place of helpfulness which makes it recognized today as a potent and powerful factor throughout the nation. We look to the new year now upon the Pacific Coast Section N. E. L. A. as one full of promise and accomplishment under Mr. Newbert's guidance.

W. H. Whiteside of the Westinghouse Electric Company, Pasadena, has been spending a few days in San Francisco.

E. W. Clark of Los Angeles, vice-president of the Union Oil Company, made a visit to San Francisco a short time ago.

J. R. Lovejoy, vice-president of the General Electric Company of Schenectady, N. Y., is a recent San Francisco visitor.

L. K. Comstock, president of the newly enlarged Conference Club of New York, took in all three conventions, as appropriate to the mission of his organization.

J. H. Wiggins, assistant engineer, U. S. Bureau of Mines, who has been stationed at the San Francisco office of the Bureau for the past six months, has returned to his headquarters at Bartlesville, Oklahoma.

T. W. Simpson, of the Federal Sign System (Electric) of San Francisco gave a talk on "The Reason Why of Electrical Advertising" at the Pacific Coast Advertising Clubs' convention which was held last week in Stockton.

J. D. Cave, who is returning to Melbourne, Australia, after a number of years in the United States, goes back to Australia to develop a line of importing in connection with his father's long-established business in electrical and mechanical equipment.

John C. Merriam, professor at the University of California, has been elected president of the Carnegie Institute of Washington, to succeed Robert Wood Ward, who is retiring at his own request at the end of the year. Dr. Merriam is professor of paleontology at the California university and was acting chairman of the National Research Council, 1918-19.

F. D. Fagan, Pacific Coast sales manager of the Edison Lamp Works of the General Electric Company, has been elected president of the California Industries Association. He has been a director of the association for the past two years and is said to be the youngest man ever elected to the presidency.

L. C. Gordon, business manager of Ingenieria Internacional, a McGraw-Hill trade magazine published in Spanish, has been in San Francisco during the past few weeks. Mr. Gordon spoke at the National Foreign Trade Convention and presented Mr. McGraw's paper on "Service of the Technical Press to Foreign Trade."

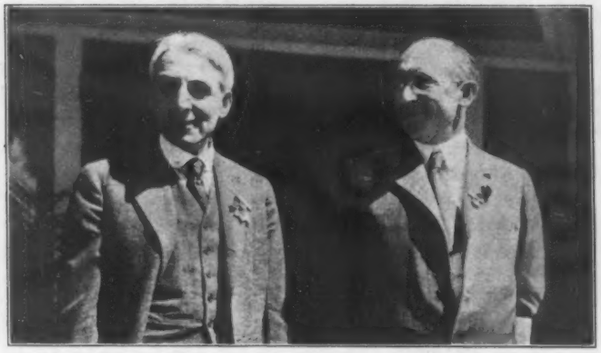
James H. McGraw, president of the McGraw-Hill Company, was unable to be in the West for the N. E. L. A. Convention or the National Foreign Trade Convention. The paper on "Service of the Technical Press to Foreign Trade" which Mr. McGraw was to present to the delegates at the Foreign Trade Convention was read by Mr. L. C. Gordon. Mr. McGraw intends visiting the West some time during the month of June.

J. E. Davidson, chairman of the newly created Public Relation Section of the National Electric Light Association, is vice-president and general manager of the Nebraska Power Company. Mr. Davidson is a well known figure in the West, as for some years he was vice-president and general manager of the Pacific Power & Light Company at Portland, Oregon, and proved a most active figure in electrical matters in the Northwest. He remained in Portland until 1917 when he went to Omaha to assume his present position. During the past week or ten days he has been visiting various power centers in the West, including his old home town of Portland.

H. W. Crozier, engineer with the firm of Sanderson and Porter, San Francisco, is at present working in France in connection with the installation of a double oil pipe line between Havre and Paris, a distance of about 150 miles. It is anticipated that 4,500 tons of heavy and 1,000 tons of light oils and spirit can be pumped through these lines daily, thus materially lightening the difficulty of supplying Paris with coal by facilitating the use of heavy oils as a substitute. It is hoped to complete the lines in time for next winter. The estimated cost is about three million sterling at the normal rate of exchange. Mr. Crozier is a Western man, having graduated from the University of California. He is considered an authority on the subject of oil pipe line transmission. Articles by him on this subject appeared in the January and February first issues of the Journal of Electricity.

R. L. Smith has been appointed by the Advisory Committee of the California Cooperative Campaign to serve as field representative in the bay district, the territory formerly covered by Curt C. Davis. Capt. Smith was graduated from Rose Polytechnic Institute with the class of '09, after which he spent some time with the Westinghouse Company at Pittsburgh. Later he served in the electrical engineering department of the Pacific Electric Railway in Los Angeles, which position he left to join the sales organization of the Pacific and Power Corporation. When the properties of the latter were purchased by the Southern California Edison Company, Capt. Smith was appointed district agent at Vernon, one of the principal industrial districts in the South. He resigned to enter military service and achieved the rank of Captain, spending two years in the army. He served with the Eighth Division of Engineers both in the States and in France, and later served with the Second Division in Germany.

Personalities of Pasadena



R. H. Ballard, president and general manager of the Southern California Edison Company and retiring president of the N. E. L. A., gazing with pride upon his successor, Martin J. Insull, president of the Middle West Utilities Company, who has been newly chosen leader of the N. E. L. A. for the coming year.

A. E. Morphy, secretary of the Southern California Edison Company and assistant convention chairman (on the left), and W. L. Frost, assistant general agent of the Southern California Edison Company and chairman of the convention entertainment committee, to the work of which two gentlemen so much of the pleasure of the Pasadena convention was due.

Thos. Norberg Schultz, manager of the municipal electric works of Kristiana, Norway, came the longest distance of any of the delegates to attend the gathering. Mr. Schultz for thirteen years has been president of the Norwegian Electricity Works Association and is the vice-president of the Electricitetskommission of Norway. He is spending some time on the Pacific Coast, looking into operating methods of Western companies.

D. L. Huntington, president of the Washington Water Power Company, Spokane, headed a delegation of more than thirty from Washington, among whom were **Geo. E. Quinan,** electrical engineer, and **R. C. Saunders** and **R. W. Clark,** assistant sales managers of the Puget Sound Power and Light Company, Seattle, as well as **E. A. Batwell, R. A. Lindley** and **W. H. McGrath** of the same company. **P. A. Bertrand** represented the Grays Harbor Railway and Light Company, Aberdeen, while **A. M. Chitty** of the Puget sound International Railway Company represented Everett, Washington, in the group. Among the delegates from the Washington Water Power Company should also be mentioned **John B. Fisken,** consulting engineer, and **Lewis A. Lewis,** commercial agent. In addition to those who came down on the special train, a number of manufacturers and jobbers attended the Jobbers' Convention at Del Monte and then continued south to Pasadena.

Dr. Henry Suzzalo, president of the Washington University, Seattle, was among the honored guests at convention. Dr. Suzzalo's institution has done much in cooperation with progressive forces in all branches of state activity.

Benjamin Wolf is the new radio supervisor of the Pacific for the U. S. Shipping Board and will have his headquarters in San Francisco.

W. J. Meara, manager of the New York Edison Company, is a recent San Francisco visitor. Mr. Meara came to San Francisco ahead of the Red Special upon which he was traveling and later joined it in its trip back through the Canadian Rockies.

F. D. Schwartz, of Illinois Rubber and Insulated Wire Company, has been at the conventions and is taking a general trip down the coast.

P. S. Millar, general manager and secretary of the Electrical Testing Laboratories of New York City, is a recent Pacific Coast visitor where he has attended the Pasadena Convention of the N. E. L. A., and later has spent several days in San Francisco and other Pacific Coast cities.

F. V. Burton, accompanied by Mrs. Burton, attended both the Jobbers and N. E. L. A. conventions and is an enthusiastic coast visitor.

W. D. Steele, general sales manager of the Benjamin Electric Company, Chicago, was a convention visitor.

Fred Skeel, western representative of the Crouse-Hinds Company, and **A. F. Hues,** sales manager from Syracuse, attended both conventions and returned home through the Northwest.

O. B. Coldwell, second vice-president of the Portland Railway, Light and Power Company, was largely responsible for the enthusiastic representation from the northwest, particularly the generous sprinkling from the Beaver City. **Franklin T. Griffith,** president of the Portland company, **C. P. Osborne,** superintendent of power, and **A. C. McMicken,** sales manager, were among the representatives from the Portland Railway, Light & Power Co., while the Pacific Power & Light Co. sent among others its president, **G. W. Talbot, W. M. Wood, H. H. Schoolfield,** chief engineer, and **Lewis A. McArthur,** general manager. Other power companies from this district which were represented were the North Coast Power Company in the person of **R. M. Boykin,** vice-president, and the Bend Water, Light and Power Company of Bend, Oregon, whose manager, **T. H. Foley,** was a member of the party.

J. Nelson Shreve of Holabird Electric Cable Company was at Del Monte and Pasadena, and is taking advantage of the trip to visit other coast cities.

R. J. Davis, Pacific Coast representative of the Century Electric Company, has returned to his San Francisco headquarters after several weeks' visit to the business centers in the East, particularly at his home company in St. Louis, Missouri.

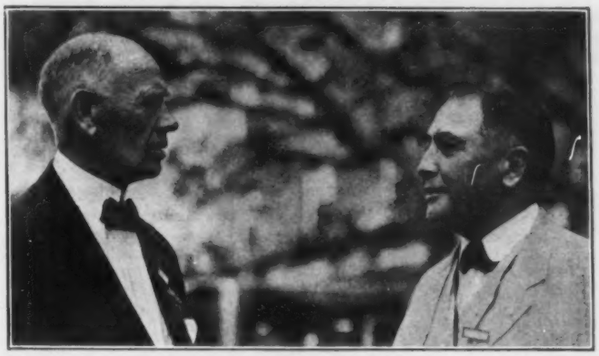
J. A. Clay, general manager of the Western Colorado Power Company, **L. M. Gazin** of the Trinidad Electric Company, **C. A. Semrad** of the Western Light and Power Company, **G. H. Walbridge,** chairman of the board, Colorado Power Company, and **T. O. Kennedy,** of the Denver Gas and Electric Company, were among the twenty or more delegates from Colorado—one of the strongest delegations sent from any state to convention.

W. H. Archbold of Archbold-Brady Company was an interested visitor at the Pasadena convention and expressed himself as being very enthusiastic regarding the future business outlook on the coast.

P. S. Klees of the Pierce Fuse Corporation, Buffalo, New York, is visiting the Pacific Coast renewing old acquaintances.

E. W. Rockafellow, Western Electric Company, New York, attended the Jobbers' Convention at Del Monte and the N. E. L. A. Convention at Pasadena, and is also visiting Western Electric branches on the coast.

N. E. L. A. Convention



An active representation covered convention from Boston. Wm. H. Atkins, general superintendent of the Edison Electric Illuminating Company of Boston Mass., (on the left), conversing with R. S. Hale, superintendent of the special research department of the same company and community somewhere in the Hotel Huntington grounds.

A. D. Blake, managing editor of Power, and **G. E. Andrews,** business manager, were among the twenty-three representatives of the McGraw-Hill Company from the New York and Pacific Coast offices who attended convention. Among the others were: **W. H. Onken, Jr.,** editor Electrical World; **O. H. Caldwell,** editor Electrical Merchandising; **Robert Sibley,** editor Journal of Electricity and Pacific Coast editor the McGraw-Hill Electrical Trio; **A. M. Perry,** engineering editor, Electrical World; **W. M. Deming,** Pacific Coast manager McGraw-Hill Company; **A. H. Halloran,** McGraw-Hill Book Company; **H. A. Lewis,** advertising director, McGraw-Hill Company; **A. T. Tregoning,** circulation department, McGraw-Hill Company.

E. P. Bacon, vice-president and general manager of the Natrona Power Company of Caspar, Wyoming, was one of the representatives from the far north who helped to make the Pasadena convention truly representative of the entire nation.

D. F. Johnson, member of the Arizona Corporation Commission, was the third public utility commissioner who attended the convention. Both **E. O. Edgerton,** president of the California Railroad Commission, and **Carl D. Jackson,** president of the Wisconsin commission, gave addresses which stood out as among the most important features of convention.

Stephen E. Dillon, general manager of the Citizens Electric Company of Hot Springs, Arkansas, was one of the enthusiastic group from that city who were urging that convention be held in Arkansas next year.

W. Creighton Peat, president of the National Association of Electrical Contractors and Dealers, represented the contractor-dealers in the councils of state, while from the Electrical Jobbers' Association, the chairmen of the three sections were present: **A. M. Little,** eastern division, **W. R. Herstein,** central division, and **C. C. Hillis,** Pacific division.

C. E. Corrigan, vice-president of the National Metal Molding Company, Pittsburgh, and Chas. Boynton, New York representative of the company, attended the Jobbers' Convention at Del Monte, later visiting other Pacific Coast points. Mr. Corrigan's birthday occurring during the Del Monte Convention, was celebrated by a dinner dance tendered Mr. Corrigan by Mr. and Mrs. Garnett Young of the Garnett Young Company, Pacific Coast representatives of the National Metal Molding Company.

R. E. Thompson, manager of the Deming Ice and Electric Company of Deming, and **C. M. Einhart** of the Roswell Gas and Electric Company, both of New Mexico, were prominent among the delegates from the Southwest in all sessions.

Wm. L. Goodwin, the fruit of whose work toward co-operation in the industry was evident in so many of the activities represented at the conventions, made one of the important addresses of the Electrical Supply Jobbers' Convention at Del Monte. In order to take advantage of Mr. Goodwin's visit to this coast, joint meetings have been arranged in the principal cities of the West to hear his message of cooperation and good merchandising and have been attended by representative gatherings of men from all branches of the industry.

H. L. Aller, vice-president and general manager of the Pacific Gas & Electric Company of Phoenix, **M. V. Watson,** manager of the Prescott Gas and Electric Company of Prescott, **W. S. Sultan,** general manager of the Globe Light and Power Company of Globe, **G. T. Herrington,** manager of the Flagstaff Electric Light Company of Flagstaff, and **R. S. Masson,** vice-president of the Arizona Power Company, were among the important power company officials from Arizona who helped to make up the strong group which represented that state.

A. Monro Grier, of the Canadian Niagara Power Company, Niagara Falls, Ontario, and **John R. Read,** manager of the Canadian Westinghouse Company from Hamilton, Canada, represented our brothers to the north at convention sessions and brought news of electrical progress across the border.

Practically every state in the Union was represented at the big convention. The following list includes one delegate only of the many from each state:

H. C. Abell, Electric Light and Traction Company.....New York
H. Carl Albrecht, Philadelphia Electric Company.....Pennsylvania
E. A. Barrows, Narragansett Electric Lighting Company.....Rhode Island
J. M. Barry, Alabama Power Company.....Alabama
S. J. Bertron, Jr., Houston Light and Power Company.....Texas
W. P. Beyerle, Consolidated Gas, Electric Light & Power Co.....Maryland
H. C. Blackwell, Kansas City Power and Light Company.....Missouri
F. E. Blake, The Hawaiian Electric Company.....Hawaii
Geo. A. Campbell, Truckee River General Electric Company.....Nevada
Frank R. Coates, Toledo Railways and Light Company.....Ohio
H. A. Coles, Westinghouse Electric & Manufacturing Company.....Georgia
George B. Leland, The Stamford Gas and Electric Company.....Connecticut
J. G. Cronin, United Electric Company, Wichita.....Kansas
Morse DellPlain, Northern Indiana Gas and Electric Company.....Indiana
Frank J. Duffy, Southern Railway and Light Company.....Mississippi
B. C. Edgar, Chattanooga Railway and Light Company.....Tennessee
C. M. Einhart, Roswell Gas and Electric Company.....New Mexico
Dudley Farrand, Public Service Electric Company.....New Jersey
H. A. Fee, The Citizens Light and Power Company.....Michigan
H. W. Fuller, Northern States Power Company.....Minnesota
L. N. Gilbert, Zephyrhills Electric Company.....Florida
F. D. Gordon, Androscoggin Electric Company.....Maine
J. E. Harsh, Lincoln Gas and Electric Company.....Nebraska
W. C. Lounsbury, Superior Water, Light and Power Company.....Wisconsin
Alfred S. Nichols, Paducah Electric Company.....Arkansas
Edward A. Phinney, Jefferson County Power and Light Company.....Colorado
D. D. Price, Durham Light and Traction Company.....North Carolina
Harry Reid, Kentucky Utilities Company.....Kentucky
N. T. Wilcox, Mississippi River Power Company.....Iowa
L. E. Sinclair, Potomac Electric Power Company.....Washington, D. C.
R. W. Wilde, Desert Power and Water Company.....Arizona
Percival Stern, Interstate Electric Company.....Louisiana
S. R. Inch, Utah Power and Light Company.....Utah
D. L. Huntington, Washington Water Power Company.....Washington
Franklin T. Griffith, Portland Railway, Light and Power Co.....Oregon
H. H. Cochrane, Montana Power Company.....Montana
Thos. W. Neill, Kootenai Power Company.....Idaho
E. P. Bacon, Natrona Power Company.....Wyoming
R. H. Ballard, Southern California Edison Company.....California

Hon. Wm. D. Stephens, Governor of California, in an address before the convention on the 19th, expressed the friendly appreciation by the state of an industry which has meant so much to the development of the West.

H. D. Hawks, general sales manager of the Anaconda Copper Mining Company, with Mrs. Hawks, came all the way from Montana to attend convention in the Southland.

Meeting Notices for Electrical Men

(The seventh national Foreign Trade Convention and the Foreign Trade meetings of the San Francisco Electrical Development League are features of this set of meeting notices. An advance item concerning the Pacific Coast A. I. E. E. convention is included among other A. I. E. E. and A. S. M. E. news.—The Editor.)

The National Foreign Trade Convention

The Seventh National Foreign Trade Convention which was held in the San Francisco Civic Auditorium May 12th to 15th was the greatest in history. Twenty-five hundred delegates were in attendance. The general convention theme was as follows: "The Effect of Being a Creditor Nation."

The final report of the general committee urges that as a creditor nation the United States should afford other nations every fair and reasonable opportunity to sell their products to us, especially raw materials. Full employment of manufacturing facilities was urged so that production may be increased to the maximum in order to restore normal conditions of employment and living.

Final deduction favors supplemental legislation to the Webb-Pomerene Act; the allocation of more passenger vessels to South American and trans-Pacific trade; the building of ships for export; the establishment of foreign trade zones at ports of entry; the extension of international parcel post facilities; the federal incorporation of American firms in China; the construction of additional cable facilities and the extension of radio service. The general meeting was called to order by James A. Farrell, president of the United States Steel Corporation and chairman of the National Foreign Trade Council. The chairman of the meeting was Alba B. Johnson, former president of the Baldwin Locomotive Works. O. K. Davis was secretary.

Fifteen group sessions of the various phases of world trade were considered. Representatives of forty foreign countries were present as guests and delegates. In the session on "Foreign Trade and the Press" a paper by James H. McGraw, president of the McGraw-Hill Co., Inc., was presented on "The Service of the Business Press." L. F. Gordon, editor of Ingenieria Internacional, was present at this session. The McGraw-Hill Company had a large display among the exhibits in the convention auditorium.

The trade adviser service with a staff of two hundred gave individual conferences to delegates. Among these advisers were E. Wilhemli Exeesten of the Robbins and Myers Company, who advised on the export of electrical goods, and M. A. Oudin, vice-president of International General Electric Company, on the same subject. W. W. Nichols of the Allis-Chalmers Company spoke on the reorganization of government service of trade promotion and information.

A luncheon of the American Manufacturers' Export Association was held in the Palace Hotel on the thirteenth of May in connection with the convention. The banquet held in the Civic Auditorium on May fourteenth was one of the largest ever held in this country.

At the conclusion of the convention many delegates remained on the Pacific Coast to visit the many scenic regions and to investigate the industrial resources of the West.

Foreign Trade Meeting of Electrical Development League

The regular meeting of the San Francisco Electrical Development League, held at the Palace Hotel in San Francisco on May 10th, was a Foreign Trade meeting, the chairman of the day being Mr. Aubrey Drury, the secretary of the Foreign Trade Club. In introducing Mr. W. E. Row of Fobes & Co., Shanghai, China, Mr. Drury traced the development of foreign trade in the United States, emphasizing particularly that previous to the completion of the Panama Canal there was practically no foreign trade and that it was for the World War to bring about the big awakening of America to its possibilities.

Mr. Row spoke on the development of the Far East and mentioned particularly the General Electric and Western Electric factories in China where electric globes are being manufactured, the bases being imported from the United States. Mr. Row spoke encouragingly of the possibilities of China's becoming a manufacturing country due to the great amount of cheap manual labor there.

Mr. A. R. Hagar, the next speaker, is chairman of the delegates of the American Chamber of Commerce in China to the Foreign Trade Council. He is also president of the Ad Club in China and manager of the International Correspondence School of Asia. Mr. Hagar spoke on Foreign Trade legislation, business outlook in general and on manufacturing possibilities. He said that the future need of China is machinery and teachers, and went on to speak of the necessity of having American agents in China to represent the American manufacturing houses. Mr. Hagar also urged special legislation which would enable the federal incorporation of American firms so that concerns in this country can compete with English firms for whom special legislation benefiting trade with China has been enacted.

The meeting was well attended and there were a large number of out-of-town guests at the luncheon, due to the Foreign Trade Convention in San Francisco and also to the fact that a great number of electrical men were en route to the Jobbers' Convention at Del Monte and the N. E. L. A. Convention at Pasadena.

BUILDERS OF THE WEST — LXXVIII

FRANKLIN T. GRIFFITH

While the commercial element of the electrical industry of the West has visualized in dollars and cents the possible returns from power plant installation, and the engineer with creative imagination has accomplished in the West during the present decade feats of construction and design equaled nowhere else in the world, the analytical mind of the lawyer has been at work on the conditions which can facilitate or retard this progress. To Franklin T. Griffith, president of the Portland Railway, Light & Power Company and chairman of the Water Power Development Committee of the National Electric Light Association, this issue of the Journal of Electricity is affectionately dedicated, in appreciation of his helpful thought in outlining the legislation necessary to bring about the economical and adequate development of our water power resources, and for his magnificent analysis of the ultimate public benefits inherent in this development.

A. I. E. E.—Seattle Section

The regular May meeting of the Seattle Section of the A. I. E. E. was held in the Chamber of Commerce assembly room on the 18th of May. Mr. H. J. Sheppard presented a paper on the subject, "Methods Used in Laying Submarine Cables." Mr. Sheppard is district plant engineer of the Pacific Telephone and Telegraph Company.

The paper was illustrated by slides which helped to set forth the methods which have been used by the author in laying long submarine cables of large diameter.

A. S. M. E.—San Francisco Section

The regular monthly meeting of the San Francisco Section of the American Society of Mechanical Engineers was held in the Engineers' Club on the twentieth of May. A paper on "Problems in Connection with the Commercial Development of the Aeroplane" was presented by Dr. Wm. F. Durand, who is a recognized authority on the subject. His connection with the Aircraft Development Board during the war made it possible for him to treat the subject in a most interesting manner.

A. I. E. E. and N. E. L. A.—Portland, Oregon Sections

The annual joint meeting of the Portland sections of the A. I. E. E. and the N. E. L. A. was held at the Auditorium University Club a short time ago Mr. Robert G. Dieck, engineer of the Committee of Fifteen, addressed the meeting on the subject, "The Swan Island Project."

The annual election of officers of the N. E. L. A. section was held during a short business meeting which preceded the address.

National Engineers' Convention at St. Louis

The Sixth Annual Convention of the American Association of Engineers was held in St. Louis on May the tenth. At that time delegates representing eighteen thousand engineers considered important policies affecting the engineering profession.

Los Angeles Engineers Elect New Officers

The recent election of officers in the Los Angeles Chapter of the American Association of Engineers resulted in the selection of the following: A. L. Harris, president; H. Z. Osborne, Jr., vice-president; R. H. Holbrook, secretary; W. D. Armstrong, Myron Hunt, F. C. McMillan and F. H. Olmsted, directors.

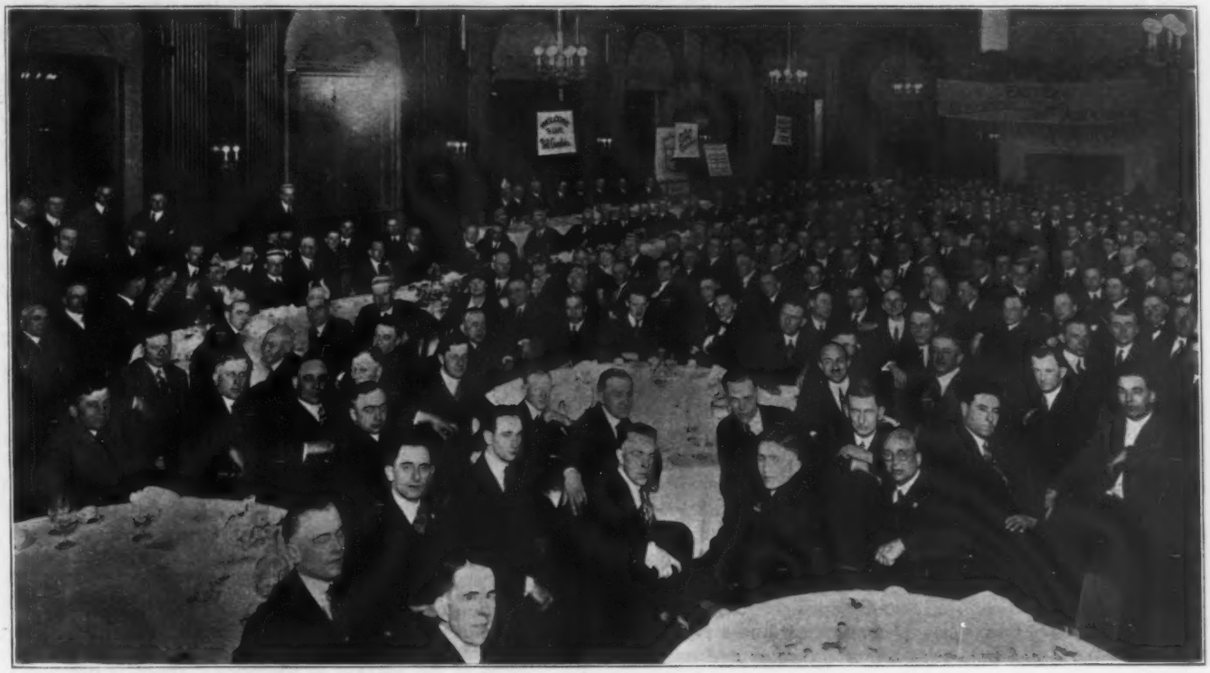
San Francisco Electrical Development League

"Ye Old Tyme Meeting" of the San Francisco Electrical Development League, which was held at the Palace Hotel, San Francisco, May third, was a great success. Henry Bostwick, manager San Francisco district, San Francisco Gas & Electric Company, was chairman of the day and due to the example set by him the meeting was unusually full of spirit. During the course of the meal Max Breakhill and John Gilbert of the Pacific Gas & Electric Company, accompanied by Oscar Young, entertained the members with songs. There were also several selections on the accordion.

One feature of the day was the introduction of the "League Twins," which had been kept as a mystery. Mr. Bostwick introduced Mr. Garnett Young as Mr. Sam Wiggin and vice versa. This caused a lot of fun as each told the life history of the other. The second twins proved to be Mr. Lee H. Newbert and Mr. R. M. Alvord, who held a "mutual admiration society" meeting instead of following the satirical mood of the other pair. In the prize roll call Mr. Arthur Dahl, of the Charles W. Dahl and Son Electric Company, won the prize for the snappiest announcement.

Advisory Committee Meeting, California Cooperative Campaign

At the meeting of the Advisory Committee of the California Cooperative Campaign at Visalia, on April 23, Secretary H. W. Angus was instructed to assist Mr. B. F. Pearson of the Southern California Edison Company as a member of the publicity committee of the N. E. L. A. convention. It was decided that the campaign would have an exhibit at the



THE GOODWIN-CHASE MEETING

Meeting of three hundred and fifty electrical men held recently in the San Francisco Commercial Club under the auspices of the California Electrical Cooperative Campaign. A complete account of this meeting was given in the May 1st issue of the Journal of Electricity among the Meeting Notices for Electrical Men. The banquet hall was decorated with cards exalting the cooperative idea and welcoming "Bill" Goodwin, who has done more than any other man in the electrical industry to make this idea a working basis for all members of the industry in this country. Speeches were given by A. Emory Wishon, Harry Kirkland, Samuel Adams Chase and W. L. Goodwin.

N. E. L. A. convention which would be self-explanatory and show the various activities of the campaign and the results obtained. Plans were made to give more publicity to the convenience outlet campaign by the distribution of plans of Electrical Home No. 2 among the trade and central stations, and the distribution of the N. E. L. A. booklet "Comforts and Conveniences of Electricity in Your Home." The next meeting of the Advisory Committee was set for June 11th and 12th at San Francisco.

A. I. E. E.—Pacific Coast Convention

The ninth annual Pacific Coast Convention of the American Institute of Electrical Engineers will be held in Portland, Oregon, July 21-23, 1920, under the auspices of the Portland Section.

The program is not complete as yet but details as to the papers, authors and entertainment features will be ready for publication by the middle of this month.

Upon recommendation of the Portland Section officers and Vice-President Fisken, the following Pacific Coast Convention Committee has been appointed by President Townley: R. M. Boykin, chairman, O. B. Coldwell, Wm. J. Cottrell, R. L. Elder, L. G. Fear, Lee W. Going, W. C. Heston, W. F. Hynes, A. H. Kruel, R. F. Monges, A. S. Moody, C. P. Osborne, E. D. Searing, W. S. Turner, Carl L. Wernicke, E. F. Whitney, J. E. Yates, all of Portland; and the following chairmen of other sections—H. S. Evans, Denver; Markham Cheever, Salt Lake City; Clem A. Copeland, Los Angeles; R. F. Hayward, Vancouver; G. E. Quinan, Seattle; J. E. E. Royer, Spokane; W. G. Vincent, San Francisco.

Annual Meeting and Edison Medal Presentation

The annual business meeting of the A. I. E. E. was held May 21st in the auditorium of the Engineering Societies Building, New York. At this meeting the board of directors made its annual report, including a financial statement for the year ending April 30, 1920. The report of the Tellers was also presented, giving the results of the election of officers for the ensuing administrative year.

Immediately following the business meeting the ceremony of the presentation of the Edison Medal took place. This medal was founded by the Edison Medal Association, composed of associates and friends of Mr. Thomas E. Edison, and is awarded annually by the American Institute of Electrical Engineers "For Meritorious Achievement in Electrical Science, Electrical Engineering, or the Electrical Arts."

The Edison Medal has been awarded this year to Mr. W. L. R. Emmet "For Inventions and Developments of Electrical Apparatus and Prime Movers," and the presentation ceremonies were as follows:

1. "The Edison Medal," by Carl Hering, chairman, Edison Medal Committee.
2. "Achievements of W. L. R. Emmet," by H. W. Buck.
3. Presentation of the Medal, by Calvert Townley, president, American Institute of Electrical Engineers.
4. Response, by W. L. R. Emmet.

Mr. Emmet is the inventor of several types of transformers, including a form of air-blast type; of several types of insulation of alternators, and of the oil switch. After experimentally investigating the possibilities at Brooklyn and Niagara Falls, the heaviest circuits then existing, he was the first to design and use switches of this type. The varnished cambric cable is also an Emmet invention. He is also the inventor of the vertical shaft steam turbine. Mr. Emmet's achievements have been those of an engineer and a pioneer of new methods rather than those of an inventor and much of his original and most useful work could not be effectively patented, nor perhaps even classified as invention.

His principal employment has been with the Sprague Electric and Motor Company and the General Electric Company.

THE ELECTRICAL CREDIT ASSOCIATION

Picture of the banquet held in connection with the fifteenth annual meeting of the Electrical Credit Association of the Pacific Coast, which took place recently in San Francisco. Several interesting speeches and committee reports were given and the annual election of officers took place. R. J. Holterman, manager of the Holabird Electric Company, was elected the new president. A complete account of the meeting was given in the May 1st issue of the Journal of Electricity among the Meeting Notices for Electrical Men.

WORLD METRIC STANDARDIZATION CONFERENCE

A World Metric Standardization Conference was held in San Francisco on the 17th of May for the purpose of joining into concerted action the support behind the movement to get weights and measures in English-speaking countries standardized on the metric basis. This conference was called by the American Metric Association, the Manchester and London Decimal Association and the World Trade Club of San Francisco, in cooperation with the American Institute of Architects, the American Chemical Society, The Washington State Manufacturers' Association and similar organizations that urge metric adoption.

This Conference was the outcome of a campaign to get legislation providing for the gradual adoption of the metric units as exclusive measurements in the United States and Great Britain. Up to this time 60 Chambers of Commerce have adopted resolutions endorsing the campaign and statements of support have been formally voted by the American Institute of Electrical Engineers, Western Association of Electrical Inspectors, American Society for the Advancement of Science, National American Scale Men's Association, and many other like societies.

Rear-Admiral J. L. Jayne, commandant of the Twelfth Naval District, and Colonel Thomas H. Rees, representing General Liggett, were among the principal speakers at the general meeting. John J. Arnold, National Foreign Trade Councillor and Supervisor of the International Business Department of the Bank of Italy, acted as chairman.

Mr. B. Darrow of the Technical Department of the Goodyear Rubber Company explained why that company had decided to equip and operate its new Los Angeles plant entirely on the metric basis. Mr. C. M. Lewis, secretary of the Manufacturers' Association of Washington, also spoke.

Among those who sent special messages to the conference were Luther Burbank, Wm. G. McAdoo, General Pershing, Franklin K. Lane, Alexander Graham Bell, Thomas A. Edison, Henry Ford and James Speyer.

In connection with the article, "Hydroelectric Development in Southern California," by W. A. Brackenridge, which appeared in the May 15th issue of the Journal of Electricity, credit is due I. H. Lecklider, assistant electrical and mechanical engineer of the Southern California Edison Company, for the valuable work done by him in connection with its preparation.

HAPPENINGS IN THE INDUSTRY

PACIFIC GAS AND ELECTRIC COMPANY'S CONSTRUCTION PLANS

In a statement before the Railroad Commission, John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, said that in the next eleven years the company would spend $123,000,000 in development of the Pit River project. Of this $63,000,000 will be spent on the hydroelectric project and $60,000,000 in substations and transmission lines. Mr. Britton also stated that he expected the eleven years would add 450,000 customers to the company's list, basing this estimate on the fact that in the last eight years the company had given service to 250,000. The first two units of the Pit River development are now under way. These consist of two separate installations of 12,500 kw. each on Hat Creek, which is the most important tributary of Pit River.

The machinery for the construction work is now being hauled from the company's tunnel site at Big Bend on the Pit River to the Hat Creek power house site. The majority of the current generated by these two plants will be available by the beginning of this winter and these two power houses will generate most of the energy used in the rest of the Pit river development construction work.

The water rights purchased on the Pit River from the Mt. Shasta Power Company, Northern California Power Company, and the Red River Lumber Company have cost the Pacific Gas & Electric Company $1,250,000. The plans for the construction of the ten hydroelectric plants on this river will make available 400,000 hp. The plans of the company call for the securing of $10,000,000 new capital each year. Mr. Britton estimated that the units would be completed and new power delivered as follows: In 1921, 60,000 hp.; in 1923, 44,000 hp.; in 1925, 60,000 hp.; in 1927, 57,000 hp., and in 1930, 79,000 hp.

The case in hearing before the Railroad Commission at the present time is for an increase in rates for electricity to all consumers. Application was made for permission to place a surcharge on all bills, pending the final determination of the rates the company will be permitted to charge. W. G. Vincent, valuation engineer of the company, submitted estimates calculated to show that present rates would produce a deficit of $2,334,380 on the estimated business of the company during 1920. He estimated that the 1920 revenue at the present rate would be $19,455,528 and that the total expenses would be $12,808,431, leaving $6,047,097 for return on investment, which he said was $1,893,279 less than the return allowed by the Commission on the rate basis of properties. Mr. Downing, vice-president, in charge of electrical operation and maintenance, estimated the output of all of the plants for 1920 at 1,411,514,990 kilowatt-hours, divided as follows: from hydroelectric plants, 695,911,664; steam plants, 610,899,010 and by purchase from other companies, 104,704,-315 kilowatt-hours. Because of the water shortage, he estimated that the fourteen steam plants of the company would necessarily be run at capacity load with an expenditure of $5,127,050 for oil. Downing submitted an estimate of $2,028,-444 for maintenance account of 1920.

VALUATION OF SIERRA AND SAN FRANCISCO POWER COMPANY

In a hearing before the Railroad Commission of California to fix rates for electricity and water for the Sierra and San Francisco Power Company, the Railroad Commission's engineers submitted their appraisal at the value of the physical property of the company. According to the engineers' report it would cost $11,846,236.64 to reproduce anew the company's plant. The segregation of the value of the properties was as follows: electric, $11,234,639.64; water properties, $413,024; non-operative property, $187,673. This estimate was made on December 31, 1919. The depreciated value of the operative property, both water and electric, was estimated at $9,379,637.79. The Sierra and San Francisco Power Company is now a part of the system of the Pacific Gas & Electric Company, having recently been taken over under a fifteen-year lease.

EXTENSION COURSES IN ELECTRICITY

Two courses in electricity, of 15 lessons each, have been prepared by the Technical Department of the University of California Extension Division which aim to give instruction in electricity to persons who have no knowledge of the subject and to those who have a good practical idea of the craft but desire technical training and theoretical instruction that they may advance faster in their work.

These courses make is possible for an engineer in a remote Sierra generating plant; a lineman patrolling a far-flung transmission line; a substation operator; a radio operator ashore or at sea; or a salesman who handles electrical goods, to acquire knowledge and training while staying at his work. Correspondence lessons are sent from Berkeley to all parts of the state, and even to all parts of the world where there is a post office.

The two correspondence courses in electricity have just been revised by the Extension Division instructors. The lessons include a set of problems to be solved. The students' papers are corrected by the instructors and are returned with answer sheets and supplementary instructions. The two courses given cover respectively direct currents and alternating currents.

SOUTHERN CALIFORNIA EDISON COMPANY BOND ISSUE

The Southern California Edison Company has been given permission by the Railroad Commission of California to issue $5,000,000 in general and refunding mortgage 6% bonds. The purpose of this new issue of bonds is to provide money for the completion of a plant, the total capacity of which is 63,000 hp., now under construction on Big Creek on which the company plans to spend a total of $8,500,000 during the remainder of this year. In granting the application of the company for bonds the Railroad Commission stated: "The applicant's evidence shows that it has definite plans for the development of both water and steam power projects to meet its requirements for at least eight years in the future and at an estimated cost of $100,000,000. The Southern California Edison Company's water rights on Kern river, upper San Joaquin river and Big Creek are capable of developing a total of 900,000 hp."

POWER ADMINISTRATOR ASKS CO-OPERATION OF INDUSTRIES

Warning large users of power that the deficient rainfall of this year and the large increase in the use of electricity will result in a serious power shortage during the summer, State Power Administrator H. G. Butler has sent out more than a score of letters urging conservation of power. The letters were sent to all gold dredgers and cement mills operat-

ing in northern California, interurban car lines, both north and south, and the street railroads of the northern cities. In his letter Butler said:

"The most important single thing that can be done to minimize this shortage is to make the demand on the power companies as uniform as possible during the week and during the 24 hours of the day, as a uniform load enables these companies to operate their steam plants to full capacity all the time, thus making more power available to consumers.

"The extent to which restrictions will become necessary later will depend, to a large extent, on the success of consumers in reducing their normal consumption. It is probable, however, that some restrictions will be necessary later in the season and plans should be prepared so a material reduction can be made in your load then with a minimum of inconvenience to your patrons and yourselves."

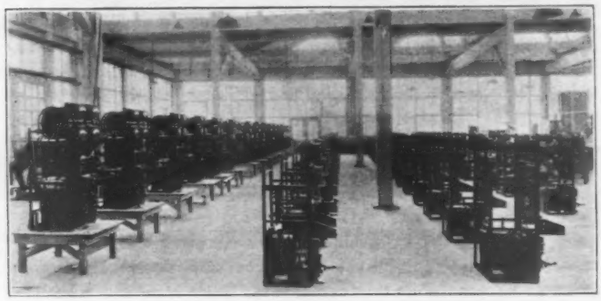
As a means of conserving power Butler suggested to the interurban roads that they should arrange, as far as they can, to run their freight trains and do their switching during the night hours after the middle of May.

The gold dredgers and cement mills were also urged to make their heaviest demands for power "come during the night hours after the middle of May."

WESTERN MANUFACTURE OF RADIO EQUIPMENT

The result which the war has had upon the increased manufacture of electrical equipment in the West is well illustrated by the story of the Kilbourne and Clark Manufacturing Company of Seattle, Washington.

This company was organized some thirteen years ago for the manufacture of radio telegraph apparatus, and due



Picture showing the navy equipment in the assembly department of the Kilbourne and Clark Company, western manufacturers of radio equipment. This organization is now under contract to equip approximately five hundred shipping board vessels, as well as several shipping vessels for private interests.

to the production of a material portion of the large number of radio sets required during the war, now holds a place as one of the largest producers of wireless telegraph apparatus in the whole country. A great deal of research work looking to the simplification of a design and improvement in the mechanical construction of radio apparatus has been done, and as a result the company has been able to greatly improve this class of apparatus.

At the present time the company maintains as a subsidiary organization the Ship Owner's Radio Service, Inc., the purpose of this organization being to contract with ship owners for the handling of their accounts, furnishing them with all radio forms, recommending and hiring experienced operators, inspecting apparatus, and doing all necessary repair work. The organization is under contract to furnish this service to approximately five hundred shipping board vessels as well as to a large number of private shipping interests. For this purpose, thirteen service stations in the United States and one in Honolulu are maintained.

ELECTRIC SHOWS AND EXHIBITS REGULATED

As interest in electric shows and exhibits increases it is hard for individual manufacturers to determine the merits of the various shows at which they are asked to exhibit. And so, at the request of the Electric Power Club, a committee was appointed some time ago by the Electrical Manufacturers Council to give careful consideration to the entire subject.

Recommendations have been adopted by the Council, based on the report of its committee, and are as follows:

1. For the fullest cooperation, it is strongly recommended that exhibitors as a whole shall have representation in the management of the show equal to that of the local management.
2. Class and nature of exhibits shall be determined by the show management. Concessions for sale of knicknacks, candy, toys, etc., shall be prohibited as they detract from the educational value of exhibits.
3. Souvenirs represent waste and extravagance of a character which the industry is trying to prevent. They are not beneficial in promoting the main educational object of shows. Their distribution at shows shall therefore be prohibited.
4. Exhibitors shall not be asked to give financial support through advertisements or in any other way to programs and catalogues. These, if issued, shall not contain any advertisements.
5. Passes shall be issued to officers, official representatives and attendants of companies exhibiting, the number to be based equitably on the space occupied.
6. Exhibitors may have trade tickets at one-half the regular admission price, settlement to be made on the basis of the tickets actually turned in at the gate.
7. The show management shall strive to make the character of the exhibit such as will reflect credit upon the electrical industry and at the same time keep the expense within reasonable limits. Any surplus after payment of legitimate expenses shall be returned to exhibitors in proportion to the amount of space used.
8. The show management shall have the right to discontinue and remove any exhibit which in its opinion is objectionable to exhibitors, the public or the industry.
9. For the amount paid for space the show management will provide the following service to exhibitors:
   Insurance against fire and theft.
   Watchman day and night.
   Clean aisles and thoroughfare (not including exhibits).
   Store boxes and other containers in good order and at the proper time deliver them promptly to exhibitors for return shipment.
10. It is recommended that, before contracting for space or otherwise committing themselves to participate in an electric show or exhibit, all electrical manufacturers ascertain from the Secretary of the Electrical Manufacturers Council if the management thereof has adopted the foregoing recommendations.

The Committee of the Electrical Manufacturers Council which considered the subject has been continued as a standing committee to which matters in reference to electric shows and exhibits may be referred.

ATTACHMENT PLUG DECISION

Word has been received that the Circuit Court of Appeals for the Southern District of New York has rendered a decision that Standard Attachment Plugs as made by the Bryant Electric Company and General Electric Company do not infringe Hubbell patents. This decision will be reviewed more fully in our next issue.

OIL FIELD RATES INCREASED

Oil Field electric service in the territory supplied by the Midland Counties Public Service Corporation will cost more in the future. The Railroad Commission having authorized the Midland company to increase its rate for that service on and after May 23, the company's rate to the oil fields will be 1.4c. per kw-hr., the same rate that is now being charged for a similar service in the territory supplied by the San Joaquin Light & Power Corporation. Its service covers certain portions of Fresno, Monterey, San Luis Obispo and Santa Barbara counties. Approximately 55% of the company's sale of electricity is to oil field consumers, who according to exhibits submitted at the hearing of the case, have been getting the energy for less than its cost to the Midland company.

CONTRACTORS ADOPT CODE

The General Contractors Association of San Francisco, has adopted a code of working rules which are to govern its members in connection with the submission of proposals for private work on and after April 1, 1920.

These rules are the result of painstaking labor extending over many months, involving conferences with architects and engineers. It has been sought to establish a uniform, equitable basis for governing the work of contractors prior to

signing of the contract, as the standard forms of contracts tend to govern it thereafter.

In brief the fourteen rules which comprise the code are as follows:

1. All competitive proposals for a specific job will be based on uniform conditions, the same for all bidders. Each contractor invited to bid shall be supplied without charge with a complete set of plans and specifications, governing the work he has been invited to bid on, and shall have the exclusive use of same until the time set for opening bids.

2. Indistinct items and plans drawn to a scale less than one-eighth (⅛) inch to the foot will not be figured.

3. In order to avoid waste of time and cost of useless estimates, it is desirable that architects state with each call for bids the cost estimate on which the plans are based.

4. Proposals may be submitted in the form of a lump sum for the entire work, or in the form of lump sums for one or more sub-divisions of the work, or on the basis of actual cost plus a percentage or fee, as called for by the owner, or his agent; but, unless bidders are furnished free of charge with a complete schedule of quantities, competitive proposals will not be submitted on more than one basis for a given job, nor will any proposal at all be submitted on a job on which proposals are requested on more than one basis; nor will proposals be made on plans on which other proposals have been tendered by a member or members of this or allied associations within the past three months; provided, however, that if within said period of time it appear that all bidders have withdrawn their proposals, in such case the owner or his agent may call for new bids regardless of the time limit hereby established.

5. Each proposal will be submitted to the owner or his agent sealed and marked on the outside with name and location of job, name of architect, time and place where bids are to be opened, and name and address of the bidder.

6. All proposals will be opened and read by the owner or his agent at the same prearranged time and place, in the presence and hearing of such bidders or their representatives as care to attend.

7. The fact that a contractor's bid has been received and opened by or for an owner is prima facie evidence that he is deemed competent and desirable by the owner. If work goes ahead with no greater modification in original plan than five per cent (5%) of his bid, the contract will be awarded to the lowest bidder. If the owner desire further to modify the cost of the work he will alter the plans and specifications accordingly and if the changes amount to no more than fifteen per cent (15%) of the lowest bid, the lowest three bidders only will figure the changes, with the understanding that the lowest bidder of the three will be awarded the job.

If the specified modifications amount to more than fifteen per cent (15%) of the original low bid, the owner will revise the plans and specifications accordingly and may call for bids as provided above for a new set of plans.

Modifications and alterations provided for herein are understood to include only bona fide changes in the work covered by the original bids and accepting correspondingly the cost of the building as a complete structure. Revised segregations of necessary elements of the complete structure, whereby portions of the work are merely added to or omitted from the general contract as originally described, will not be deemed bonafide changes with respect to the rights of the original bidders as hereinabove determined.

8. Bidders will not segregate nor itemize a proposal out of conformity with the terms of the call for bids, nor quote unit prices other than for excavation, pile driving, foundations, and structural and reinforcing steel, prior to award of contract.

Bidders will not submit more than one original and one alternate proposal on the whole or any single sub-division of the work.

9. The standard Contract "Form A" as heretofore published by the General Contractors Association, Inc., of San Francisco, shall be considered as embodying basic conditions under which lump-sum proposals are submitted; and where no other definite form of contract accompanies the specifications, said "Form A" shall be used to govern all work where applicable.

10. Where competitive proposals are called for in conformity with these rules, members are prohibited from participating in pools or other agreements whereby bonafide competition will be denied the owner.

11. Members are prohibited from submitting proposals to owners or agents unless invited to do so. This shall not be construed to deter members from soliciting business on legitimate lines.

12. Members are prohibited from disclosing to anyone, prior to acceptance of same, a material-man's estimate or quotation of a specialty contractor's bid.

13. Before negotiating with an owner or agent regarding a project involving on the contractor's part the submission of an estimate of cost, a member will first ascertain from his association that there are no similar negotiations pending on the same project involving members of his or allied associations. On actually opening bonafide negotiations, a member will forthwith notify the association, giving name and address of owner and location and character of the project. During the progress of negotiations, at intervals of not more than one month, the member will advise his association in writing as to the status of the case, and will report in writing to his association immediately either the breaking off of negotiations or the securing of the job.

Notice from owner or agent that negotiations have been abandoned with respect to any member will operate to clear the project.

14. Special cases wherein any of the foregoing rules appear to be inapplicable or to work unwarranted hardship, may be referred to the association and special consideration will be given same.

RECLAMATION DISTRICT TO BUILD POWER HOUSE

On account of the power shortage the rice growers in Reclamation District No. 108 have decided to install a power house of their own so that they will be independent of the power companies and can plant as much rice as they want and be assured of sufficient power to pump the necessary water. Twenty thousand acres of rice will be planted this year instead of seven thousand as of last year. The power house will be located at Knight's landing and is to cost $80,000. The plant is to be steam driven and will generate 1300 hp, the energy being delivered over the distribution system of the Pacific Gas & Electric Company.

RECENT RATE INCREASES

Three of the largest power companies in California have applied to the Railroad Commission of that state for rate increases and at the present time, one of them, the Southern California Edison Company, has been granted an increase of 2.16 cents per kilowatt hour to the ordinary consumer. This will insure the company a seven per cent return on its investment, and the increases allowed through the scale of rates will average 27 per cent. These new rates are temporary and will be in effect from April 20th until the end of the year.

The recent advance in the price of oil, which amounts to twenty-five cents per barrel, will increase the operating costs of the Southern California Edison $436,000 and the Pacific Gas & Electric Company claim that the increase in the price of oil will call for an expenditure by the company of $1,600,000 in excess of the cost of fuel oil used in its steam plants in 1919. The increase will add not less than $750,000 to the operating expenses of the Great Western Power Company.

In granting the increase of rates to the Southern California Edison Company, Mr. E. O. Edgerton, president of the Commission, said in part:

"It is vitally necessary for the continued growth and prosperity of the vast territory in Southern California supplied by the applicant with electric energy, that its full program of development go forward without serious interruption. I believe it to be in the interest of consumers that they pay rates sufficiently reasonable to enable the company to earn a fair and reasonable return upon the actual investment. Unless this is done, it is plain that the utility cannot borrow sufficient funds to carry forward necessary developments. It is of great importance that this program of development go forward. Should there be any halt in this program it is evident that tremendous losses will result to the whole community if sufficient electric energy is not developed to meet the growing demands.

"Of course, it is not to be understood that the Railroad Commission urges the payment of unreasonable rates to stimulate investment in this public utility, but when it is considered that to place this company in a position where it can successfully finance, will not result at this time in even an 8 per cent return on investment it will at once be realized that the burden upon the consumer is not unreasonable.

In considering the granting of an increase in rates of the amount contemplated, I am especially mindful of the fact that the company has been diligently active in the enlarging of its production and transmission facilities since the consolidation of the properties in 1917; it has shown an active determination to carry on development, and, from the evidence presented, has exerted every reasonable effort to meet the demands of the territory served in the face of the difficulties arising from the war period of 1918 and the need of readjustment and high costs of money, material and labor which have continued since.. The company's evidence shows that it has definite plans for the development of both water and steam power projects to meet its requirements for at least eight years in the future at an estimated cost of $100,000,000."

LETTER SENT TO POWER COMPANY CONSUMERS

In a petition to the Public Utilities Commission of Idaho, the Idaho Power Company has asked for permission to raise its irrigation rates approximately thirty per cent. Since 1916 the company has been serving its customers under a rate known as a "Development Rate" which at the time it was granted was understood by all concerned to be a temporary expedient only.

Since that time all of the items entering into the cost of service have increased more than 60 per cent and in a letter to each of its irrigation consumers the company has gone into considerable detail regarding cost of production, depreciation and plans for construction in the immediate future. In 1919 the company received $337,459.00 from irrigation customers, and for this this business alone expended $230,646.00 in operating expenses and taxes besides $332,500.00 on investment costs, including depreciation and interest. This deficit of $225,687.00 divided among the consumers means that for every dollar spent by the company, it received sixty cents from the consumer.

Having taken the consumer into its confidence, the company in its letter made a plea for fair play. Part of the letter read as follows:

"We are of the opinion that the fundamental industry of Southern Idaho is irrigation and that everything that can possibly be done to lighten the burden of irrigation costs should be done, and,, consequently, in apportioning our investment and our operating costs we have, in every possible way, favored the irrigation business in such apportionment. On the other hand, we do not believe that our irrigation customers desire to have service continued at a loss to the company serving them, as they well realize that, if this section of the country is to be prosperous, all concerns doing business in this territory on a legitimate basis should receive at least their costs of doing business.

"On January 9, 1920, we filed with the Public Utilities Commission of Idaho an application for a new set of rates to apply to our irrigation business during the irrigation season of 1920. Our actual conditions, as set forth in this petition, show that our deficit from irrigation business in 1919 was $225,549.00; that, if the rates effective in 1919 apply in 1920, our deficit from this business will be $309,382.00, and in 1921, if the rates effective in 1919 apply, $363,581.00, and we have asked the Commission to allow us to increase our rates.

"In case these rates are adopted for our irrigation service, our earnings from these rates, after paying operating expenses and providing the funds necessary to keep the property in good condition, will provide less than 6 per cent on the money invested to serve our irrigation customers, although we are paying a considerably higher rate of interest than this for our money.

"The Public Utilities Commission have advised us that, before taking any action on this matter, they desired to have the whole problem carefully studied, not only by themselves and their experts, but also by all of the customers affected. We, likewise, are very anxious to have every one of our customers appreciate the actual conditions under which we are serving them, and the costs incident thereto so that, when the rates are finally determined by the Commission, our irrigation customers will fully appreciate that we will receive, if the rates asked for in our petition are approved by the Commission, less than our costs for the service, and will not make the small profit out of our irrigation business which all utilities are allowed by law to make on all of their business.

"We desire you to give this matter very careful study and will appreciate receiving from you suggestions, criticisms or questions in connection with this situation."

TRADE NOTES

Manufacturers of Farm Machinery —

The H. V. Carter Motor Co. have moved from Van Ness Avenue to 52-58 Beale Street. Having recently added the Allis-Chalmers tractors to their rapidly growing business in farm power machinery, necessitated larger quarters for further expansion of both equipment and organization. About three years ago this company began the manufacturing of farm tractors, and D. P. King, their erecting engineer in San Francisco, was called to the factory to assist in this development. The Carter Co. requested the factory to send them the best tractor expert they could find, and Mr. King was chosen and now occupies a desk in the Beale St. office and is being welcomed back to the coast by his host of friends in the electrical industry.

Company Elects President —

At a recent meeting of the board of directors of The Wellman-Seaver-Morgan Company, Mr. John A. Penton, president of The Penton Publishing Company, was elected a director to fill the vacancy on the board caused by the death of Mr. Samuel T. Wellman.

Mr. Penton's intimate knowledge of the iron and steel trade, his wide acquaintanceship with prominent people in all lines of industry in this and many foreign countries, and his keen insight into business matters will make him a valued co-worker in the affairs of the company.

Appointment Made —

The Roller-Smith Company, 233 Broadway, New York, announce the appointment of Mr. F. R. Ryan as district manager of its Chicago office located at 739-40 Monadnock Block. Mr. Ryan has been connected with the Roller-Smith Company's office since January, 1919, in the capacity of sales engineer and his promotion to district manager was made recently.

Consolidation of Offices —

Announcement is made of the consolidation of the executive and sales offices of The Booth Electric Furnace Co., of Chicago, at the same address as the engineering and production office, which has been located at 326 West Madison St. Since May 1st the address of the general offices of the company have been at this address, where adequate office space and facilities have been secured to take care of all departments.

The company announces that the sales of the rotating brass furnace have been secured rapidly since this type of equipment was placed on the market last fall. The design of the various size furnaces has been standardized, and the shop of the company is now working on a production basis, with adequate facilities for turning out furnaces in from six to eight weeks' time from date of order.

New Headquarters —

The city sales department of the Peerless Light Company, needing more room than was afforded them at 174 West Randolph Street, Chicago, are now located in the new Peerless Building, corner of West Washington Boulevard and Union Street. Mr. Lester Henshell is in charge of this department.

New Location and Department —

The Stuart Products Corporation, manufacturers of Make-UR-Own Batteries, have outgrown the capacity of their former location at 440 South Green Street, Chicago, and are now located at 665 West Washington Boulevard. To more effectively serve the interests of their trade, a sales promotion department has been organized by this company to cooperate with their jobbers and dealers.

Sales Department Head —

Mr. Lyle Stockton Abbott now heads the Eastern sales department of the Celite Products Company, manufacturers of Sil-O-Cel Insulating Products, at 11 Broadway, New York. Mr. Abbott succeeds Mr. H. A. Mannshardt who recently resigned.

Vacuum Cleaner Business Increasing —

The Electric Vacuum Cleaner Company, Inc., of Cleveland, Ohio, maintains a warehouse and service station at 315 Mason Street, San Francisco, Cal., in order to render the maximum of assistance to its Pacific Coast distributors and dealers in the sales of Premier vacuum cleaners.

The distribution of this product on the Pacific Coast has grown in a short time from insignificant beginnings to large proportions, and the idea of the company has always been to give its Pacific Coast trade the most efficient service, and to warehouse an adequate stock on the Coast for immediate shipments. Its distributors in addition to stocking the cleaner, have also themselves carried a supply of parts for all models.

The company this spring has launched a national advertising campaign in the Post and Woman's Journals. New circular matter has been provided, and attractive window cutouts of six colors, five panels, for window displays are now in preparation.

Representative Sent to Japan —

I. F. Baker of the Westinghouse Electrical International Company, who has been located in the New York office of that company for the past two years, is now located in Tokyo, Japan, where he will act as a special representative of the Westinghouse International Company.

Mr. Baker entered the Graduate Student Course about 1908, later serving in various capacities in the Resale and Contract Sections of the Sales Department. In 1913 he was transferred to the Foreign Department which later became the Westinghouse Electric International Company.

PACIFIC COAST SECTION, N. E. L. A. CONVENTION

(Continued from page 559)

tion were realized by the men in the industry, and that this idea must be sold to the industrial plants by the contractor-dealers and salesmen. Mr. Kimball requested that the paper and discussion would not close the subject, but that the work be carried on, on account of the fact that all branches of the industry would receive the benefit of all such work. He suggested that the best possible way to carry on the promotion of this work was through the local associations of contractor-dealers and the field men of the Cooperative Campaign.

In speaking of the new lighting safety orders, Mr. Kimball said that the law only covered the necessary minimum, and that this fact should be impressed upon all industrial plants, with the plea that while they were conforming to the law, they might better make the illumination of their shops as nearly perfect as possible.

R. E. Fisher, of the Pacific Gas & Electric Company, then discussed the paper, giving the viewpoint of the central station. Mr. Fisher brought out the fact that efficient lighting marks the progress of civilization, and that to a great majority of the public, the central station was still the lighting company, regardless of the fact that the power supplied by the central station may be its principal source of revenue and business. Therefore, the central station will always be held responsible for illumination, whether it be good or bad, and it is a growing responsibility that the central station must accept. The responsibility has been shifted from one branch of the industry to the other, but, said Mr. Fisher, "It is the duty of the central station to keep in touch with the new scientific developments of the art of illumination, for it has been well said that the commodity which the company sell is light rather than current."

Mr. Fisher closed by suggesting that all central stations carefully survey the lighting of all large industrial plants on their system with a view to assisting them toward better illumination, thereby performing a real service to their consumers.

In closing the discussion on "Illumination," F. D. Fagan brought out the fact that the contractor-dealer has accepted the work done heretofore by the central station regarding the lighting of the home and the industrial plant. The money expended by the contractor-dealer in wiring a home or factory so that it is properly illuminated, goes back through all of the branches of the industry who receive their pro rata share, and gives a satisfied customer, not only to the central station, but one who will boost for the industry. Mr. Fagan brought out the fact that the lamp manufacturers have failed in selling lamps instead of lighting, since the service from the lamp is what the consumer pays for.

According to figures from the Industrial Accident Commission, fifty per cent of the industrial plants are under-lighted, and Mr. Fagan pointed out that the factories could have twice as much light as provided for in the laws and still not be over-lighted.

At the close of the discussion of this paper, D. E. Harris of the Pacific States Electric Company made the statement that he thought ten per cent of the industrial plants were properly illuminated, and said that he based his figure on researches that had been carried on.

Storage of Water at Higher Elevations

In discussing the paper on "Storage of Water at Higher Elevations," E. B. Walthall brought out the fact that there were vast areas of potential valley land in the state of California that only require water for their development, and that the need of the nation for agricultural products is going to become a greater and greater problem each year. Therefore, he said, the central stations should consider this possible irrigation load in developing power and not allow the fact that steam stations can be erected and operated more cheaply than hydroelectric stations to influence them unduly.

A. B. West of the Southern Sierras Power Company stated that the first consideration is that of the relative costs of steam and hydroelectric stations, and that the great danger lies in the assuming of the costs of these plants. He pointed out that the factors entering into hydroelectric plants are dependable, which is not the case in the steam plant, and as an example pointed out the cost of fuel oil, which in the last five years has increased from 60 cents a barrel in the field to $2.00, and further that no one cares to predict what the cost would be five years from now.

Another point was plant efficiency expressed in kilowatt-hours per barrel of oil. He stated that most of the electrical engineers intentionally or unintentionally underestimated this cost. The highest efficiency of the plant is at the time of installation and the small depreciation and maintenance charges at the start rapidly increase as time goes on.

W. M. Shepard, of the California-Oregon Power Company, in discussing Mr. Walthall's paper, stated that the greatest precipitation in California is, generally speaking, in the mountains, and that necessarily most of the suitable reservoir sites are located there.

"To a very large extent," he said, "stored water will perform two functions: the generation of hydroelectric power, and the irrigation of lands lying in the great California valleys needing irrigation.

"The activities of several California power companies in creating storage reservoirs have already resulted in augmenting the natural flow of some of the principal streams during the irrigation season, thereby making available more water for irrigation, and making it possible to bring more land under cultivation than would otherwise be the case.

"The typical load curves shown by Mr. Walthall illustrate the pronounced summer kilowatt-hour peak which in recent years has developed on practically all of the power systems of central and northern California, and it is to be noted that this high kilowatt-hour demand covers the period of minimum stream flow, thus accentuating the need for stored water and the necessity for auxiliary steam power."

H. J. Kister, assistant general manager of the Los Angeles Gas & Electric Corporation, read a paper which brought out, in the main, that there was no such thing as the 100 per cent saturation point in any industrial line, and that consequently there is always an opportunity to increase the sales of cur-

rent and appliances. To illustrate his point, Mr. Kister pointed out the fact that while many garages are practically completely electrified, there is nevertheless room for the sale of such goods as an oil filter, due to the increased cost of lubricating oils.

In closing he stated that if a research man should be appointed to tabulate information tending to show increased possibilities, such information as he would gather would be of inestimable value to the manufacturer, the contractor, the dealer, and the central station.

R. A. Balzari, of the Westinghouse Electric & Manufacturing Company, said that the manufacturer's viewpoint was a purely selfish one, and that a research such as mentioned by Mr. Kister would be of inestimable value to the manufacturer, allowing him to stock up in the various localities where there may be a demand for a particular appliance.

H. H. Courtright of the Valley Electrical Supply Company of Fresno spoke from the viewpoint of the contractor-dealer, and said that he is probably closer to the consumer than men in any other branch of the industry. Mr. Courtright urged the contractor-dealers to give 100 per cent service to their customers, and stated that an excellent way to sell central station securities would be for the California Cooperative Campaign to furnish the contractor-dealer with necessary data.

In closing, J. O. Case stated that the whole thing is merely a question of self-interest, and that a question of interest to all branches of the industry should be solved by all branches.

Engines versus Central Station Power

The discussion of the paper on "Internal Combustion Engines versus Central Station Power" was carried on by R. E. Fisher of Pacific Gas & Electric Company, who briefly summed up the salient points of the paper, and by C. R. Hunt of Robbins & Myers, who stated that the internal combustion engine was the forerunner of central station power and blazed the way for extensions in the future.

A. E. Holloway, of the San Diego Consolidated Gas & Electric Company, brought out the point that the internal combustion engine has a great advantage over the central station service, in that it can go into an undeveloped territory and give satisfactory service at a low cost, thereby developing territory to such a point that the central station can later extend its lines and serve the territory profitably. He pointed out that the most serious competition of the central station is the Diesel and semi-Diesel type of combustion engines operating on high load factor, but that the ever increasing price of oil, the excessive first cost and high maintenance of these engines are strong arguments in favor of central station power.

H. H. Courtright of the Valley Electric Supply Company of Fresno then gave a brief summary of his paper on "Standardization of Wiring Methods," and asked for some action that will result in one standard code for the entire state, so that the contractor will know exactly the conditions that he will meet, no matter where he goes to bid on a job.

R. A. Balzari of the Westinghouse Electric & Manufacturing Company then discussed his paper on "The Electrical Development of the Oil Lands," and stated that the committee has been able to secure but very little accurate data on the cost of installations. He recommended that next year the commercial committee have a committee on the same subject, and that this committee should be able to get accurate data by requesting the managers of the large oil companies to keep accurate cost data on the operation and maintenance of their gas plants during the coming year.

ACCOUNTING SESSION

The Accounting Committee session was called to order by Chairman P. R. Ferguson of the Southern Sierras Power Company, who stated that the symbol of the National Electric Light Association of $C = \frac{E}{R}$ to the Auditing Department meant Cooperation equals Efficiency and Results.

The discussion of the paper by C. P. Staal of the Southern California Edison Company, on "Some Features of Construction Accounting," was begun by Mr. Staal reading a brief resume of the paper.

R. R. Reidford, auditor of the Pacific Gas & Electric Company, said in part:

> "I am heartily in accord with Mr. Staal in his demand for not only a correct but a uniform method of recording and compiling the details of construction costs as a part of the general accounting system of public utility corporations."

Mr. Reidford then went on to point out that the segregation of all overhead charges to primary accounts is not possible, and that this can be done only on an arbitrary basis. He spoke of the neecssity of cooperation between the engineering and accounting departments in order to maintain a perpetual inventory.

In concluding, Mr. Reidford commended the work of Mr. Staal along this line, and hoped that the result of his labor would be accomplished in the very near future.

A. B. Carpenter, of the San Joaquin Light & Power Corporation, advocated the distribution of overhead construction costs over each particular enterprise, and trusted that the Commission ruling might be amended to authorize such distribution.

Mr. Carpenter testified to the value of the perpetual inventory of property kept by the statistical department of his company. He stated that the foundation for the inventory was the valuation established by an engineering company in conjunction with the Railroad Commission.

Mr. Warner stated that his company is preparing a complete inventory and advocating the maintaining of such inventory perpetually with costs as well as physical data.

In bringing the Accounting session to a close, President R. H. Ballard, of the National Electric Light Association, spoke a few words expressing the importance of the work of the accountants, especially at this time. He stated in closing that accounting is now recognized as one of the most important of the professions.

LATEST IN EVERYTHING ELECTRICAL

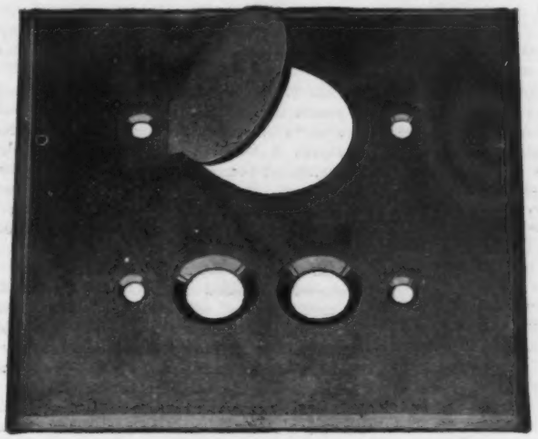
E-Z WIRE RECEPTACLE

One of the E-Z wire devices made by the Peerless Light Company of Chicago and New York. This is a flush receptacle and plate combined. It is simple and compact and being cast in one piece there is nothing to get out of order. The labor of installation is greatly reduced, the only tools necessary for that purpose being a brace, bit and screwdriver. This results in a saving of time, labor and vexatious trouble. It has two No. 14 wire leads. All standard screw plugs used on electrical devices will fit it.

Wire receptacle which combines receptacle and plate, and is unusually simple and compact.

Combination Switch and Receptacle Plate

Another device of this company is the combination switch and receptacle plate. This eliminates the inconvenience of having switch and receptacle in different parts of the room. There is scarcely a room in the house in which outlets are not required for some convenience appliance, ranging all the way from a washing machine to the manipulation of a curling iron. As may be seen, by this simple device the labor of installation is greatly reduced.



The combination switch and receptacle plate which makes it possible to have both switch and receptacle in the same part of the room.

Book and Bulletins

Radio Engineering Principles

By Henri Lauer and Harry L. Brown; 304 pages, 6 x 9, 250 illustrations. Published by the McGraw-Hill Book Company and for sale by the Technical Book Shop, Rialto Building, San Francisco.

This new book is a complete radio text book, covering the new and extensive developments made in this subject during the war. It is therefore devoted very largely to the study of the characteristics and use of the three-electrode vacuum tube in radio-telegraphy and radio-telephony, since it is around this device that the present and future of the science seem to center. In order to meet the requirements of a general text book, the principles involved in the older radio apparatus are also treated with sufficient fullness to inform the reader on all essential principles of wireless communication.

The two authors have unusual preparation for the writing of such a book. Henri Lauer was formerly Lieutenant in the U. S. A. Signal Corps and did work as assistant in the preparation of training literature on radio theory and equipment. Harry L. Brown, who was formerly Captain in the Signal Corps, was in charge of preparation of training literature on radio theory and equipment.

Book on Power

The Esterline Company of Indianapolis, Indiana, has recently published a new book on Power Factor intended especially for engineers and executives.

This book explains the subject of power factor in understandable language, discusses the evil effects of low power factor, and tells how such conditions may be detected, diagnosed and remedied.

Oil Refinery Manual

The Celite Products Company with western offices in San Francisco and Los Angeles, have published a most interesting manual which bears the title, "The Insulation of Oil Refinery Equipment."

This gives in detail the standard specifications of that company for the insulation of many types of heated equipment. It is remarkably well illustrated throughout, with some fifty pictures and diagrams showing the theory and practice of making installations. A two-page diagram shows the application of Sil-O-Cel Insulation to Standard Petroleum refining equipment to produce the highest thermal efficiency.

Industrial Arts Index

The Industrial Art Index, published by the H. W. Wilson Company, publishers of indexes and reference works, is the means of quick reference to technical magazines. It indexes every important article in more than a hundred and fifteen leading technical and industrial journals. Both the Electrical World and the Journal of Electricity are included on its list.

The Index is now issued ten times a year; that is, monthly except in July, just after the six months cumulation, and in November, while the annual or the final two-year cumulated volume is in preparation. This publication has been found especially valuable in that it does away with the keeping of individual cards index of any magazines or type of articles appearing in these magazines.

New Edition of Steel Pole Treatise

The Bates Expanded Steel Truss Company of Chicago, Illinois, have recently published a 128-page 1921 edition of their Steel Pole Treatise. This treatise is a compact engineering handbook of value to engineers and pole users. It contains information for use in the construction of modern transmission lines, electric railway lines, street lighting systems and outdoor substations.

The information includes a discussion of the engineering principles governing the design, selection and installation of all types of poles, a complete analysis of the elements governing the selection of factors of safety, and complete engineering tables. These tables include wire sags for all temperatures and spans, the conductor sizes required to transmit electric power various distances at any phase, voltage, frequency and power factor, the transverse loads at various velocities, the clearances necessary to determine the height of a pole, physical properties of wires and cables, and many formulæ and example problems which illustrate the use of the tabulated information in the solution of all pole line problems. The company is sending copies of this handbook on request.

NEW ELECTRICAL DEVELOPMENT

(A controversy over municipal street railway finances and an announcement of increased lighting charges are reported among items from the Northwest district, while under those from the Pacific Central and Southwest districts are several relating to the development of agriculture through electricity as well as a prediction of increased voltage on power lines and announcements of rate increase applications. From the Intermountain district come reports concerning municipal illumination and the development of electrically operated mines.—The Editor.)

THE PACIFIC NORTHWEST

SEATTLE, WASH.—The Empire Power Company has been incorporated by N. H. Hull and others for $100,000.

EVERETT, WASH.—At a special election May 25th citizens were called upon to vote for or against a bond issue for $2,000,000 for a municipally owned light and power system.

FOREST GROVE, ORE.—J. R. Thompson of Portland, expert electrical engineer, advised against duplication of the city lighting plant at this time but advised installation of another boiler.

SEATTLE, WASH.—W. R. Hendrey & Company, agents for the Pittsburgh-Des Moines Steel Company, have closed a contract for a 300,000-gallon hemispherical bottom steel tank on a 100-ft. tower for the city of Moscow, Idaho.

CENTRALIA, WASH.—At a meeting of the newly elected directors of the Kane Pneumatic Shock Absorber Company, plans were laid for immediate erection of a power plant to furnish power to the company factory on Fords Prairie. It will generate from 750 to 1500 kilowatts.

ANACORTES, WASH.—Chas. Freeman, original locator of the power site the rights to which were later acquired by the city of Seattle, has located two other power sites below the site upon which the city is building. One of them is capable of developing 20,000 horsepower and the other 10,000 horsepower.

TACOMA, WASH.—The firm of Albertson Cornell Bros.-Simpson of Tacoma, Wash., were awarded contract for constructing the State Group power house and heating plant at Olympia. Their bid on the contract was $155,263. The Western Construction Company of Seattle was the low bidder at $132,340 but refused to sign the contract, claiming a clerical error in their bid.

KLAMATH FALLS, ORE.—One hundred men in the employ of the California-Oregon Power Company are constructing an additional plant on the Keno Power Company's plant site near here. The Keno company was recently sold by Kerns Brothers, its founders, to W. D. Parker. It is generally believed that Parker has leased or sold the Keno system to the California-Oregon Power Company, giving it a monopoly in the local field.

SEATTLE, WASH.—Authority for Mayor H. M. Caldwell and City Comptroller H. W. Carroll, on behalf of the city of Seattle, to sign a stipulation preliminary to the issuance of the final permit for the city's free development of the Skagit River power project is contained in an ordinance introduced recently in the city council. One of the conditions of the stipulation is that the city shall sell electric current developed on the Skagit project to consumers without a profit.

SEATTLE, WASH. — Increased charges for current furnished by the city lighting department are proposed in an ordinance introduced in the city council at its special meeting recently by the public utilities committee. The ordinance increases the monthly rates charged for business and power purposes, but not the charge for residence uses, including cooking and household appliances. It also provides a service charge of 25 cents a month for each meter in use. This will apply to meters in residences as well as business houses and industrial plants, and will affect every consumer of city light. It is in addition to all other charges, either minimum or otherwise.

SEATTLE, WASH.—In a recent letter to Mayor Hugh M. Caldwell D. W. Henderson, superintendent of the municipal street railway, protests against the proposal of City Treasurer E. L. Terry to put the department on a warrant basis June 10. As a reason for his protest Supt. Henderson submits a comparative statement showing that the street railway deficit for the month of April was $37,320.45 less than it was in March, and that the deficit may be further reduced this month. Mayor Caldwell said Superintendent Henderson's report and a recommendation from the city comptroller will be taken up at the conference to be held between the members of the city council and the Seattle banks, and that undoubtedly some satisfactory plan of financing the street railway will be worked out.

SEATTLE, WASH.—The A B C Sales Company is being incorporated at Seattle by Burton R. Stare, Emerson Knoff and J. M. Thomas, and will open up the A B C electric shop at 1531 Third Avenue on June first, specializing in the wholesale and retail distribution in Seattle, Tacoma, and possibly at other points in the section later, of the A B C electric washing machine, Hoover carpet sweepers and electrical appliances of all kinds. The personnel of the company will consist of Burton R. Stare, president; J. M. Thomas, vice-president and manager, and Emerson Knoff, secretary and treasurer. A few weeks after the store is opened at Seattle a duplicate of it will be opened at Tacoma. Mr. Stare will also continue to look after his Pacific Lamp & Supply Company business at 325 Yesler Way, Seattle, and Mr. Knoff will continue as local manager and co-partner of the Juneau Hardware Company's Seattle branch office at 325 Yesler Way. Mr. Thomas was with the National Cash Register Company for a number of years and later manager for the Wholesale Typewriter Company.

THE PACIFIC CENTRAL DISTRICT

FRESNO, CAL.—The James Irrigation district will receive bids on May 15, for $1,000,000 6 per cent bonds.

CHICO, CAL.—A one-day convention of 500 employes of the Pacific Gas and Electric Company was held in this city recently.

HAMMONTON, CAL.—Fire destroyed the substation of the Pacific Gas and Electric Company here with an estimated loss of about $25,000.

YREKA, CAL.—The county board of supervisors dismissed a petition for an irrigation bond election affecting the Grenada and Big Springs district.

MODESTO, CAL.—Farmers from the West Side have petitioned the board of supervisors to organize the West Stanislaus irrigation district, which will irrigate 36,000 acres.

LEMOORE, CAL.—The taxpayers of Lemoore cast a decisive vote against the intended bond issue of $58,000 which was to be spent in building a municipally owned gas plant.

SAN FRANCISCO, CAL.—The Pacific Electric Railway Company have applied to the Railroad Commission for authority to construct a spur track at grade at 14th Street and Daley Avenue in the city of Long Beach.

SAN FRANCISCO, CAL.—The Board of Public Works has awarded the Construction Company of North America the contract for the construction of aqueduct tunnels in the mountain division of the Hetch-Hetchy project.

SAN FRANCISCO, CAL.—Wells Fargo Nevada National Bank has received funds for the payment of the semi-annual coupon, due July 1, 1918, on the Oakland Transit Company's first consolidated mortgage 5 per cent gold bonds.

MARTINEZ, CAL.—A new irrigation district in the Lone Tree section was authorized by the Board of Supervisors. The district is to include 2,035 acres of land with an assessed valuation of $92,095. The Board ordered the plans for the district submitted to the State engineers for approval before calling the election.

SACRAMENTO, CAL.—A site for a masonry dam at the lower end of the Iron Canyon of the Sacramento River, five miles upstream from Red Bluff, has been discovered and determined upon by engineers from the United States Reclamation Service. A hard rock foundation upon which the dam will rest, if built, has been found.

SAN FRANCISCO, CAL.—An application for a permit to construct an overhead crossing over the tracks of the Northwestern Pacific Railroad Company between Fieldbrook and Little River Junction has been filed with the Railroad Commission by the Humboldt Northern Railway Company. The crossing is proposed as part of an extension into new timber country in Humboldt county.

RED BLUFF, CAL.—A consulting board of engineers representing the United States Reclamation Service will meet in Red Bluff and decide on the site for the proposed Iron Canyon dam. According to W. A. Beard, secretary-manager of the Sacramento Valley Development Association, who was here the latter part of last week, the present series of borings to determine the site of the dam is nearing an end.

TULARE, CAL.—The census bureau estimated that farm values in Tulare county, California, had increased over $56,000,000 from 1904 to 1910. A large part of this gain was due to electric service in the county, yet the total investment in the electric service was less than ten per cent of the gain in land values. The installation of a 20-horsepower motor may change the value of a hundred acres of land from $20 to $200 per acre.

SAN FRANCISCO, CAL.—Pending the decision of the State Supreme Court to determine the constitutionality of the act which created the State Irrigation Board, members have suspended their work. The board, it was announced will conduct no more hearings nor pursue investigations until after the court's decision is rendered. A third hearing in the contest of the Kern Delta Irrigation District, which was to have come up last week was postponed indefinitely.

WILLOWS, CAL.—As a further insurance against a shortage of power during the irrigation season, P. B. Cross, president of the Provident Irrigation District, is installing a large electric power generating plant capable of producing 2500 horsepower. The machinery was

shipped from Connecticut by freight and occupied but 12 days in transit. The generator for the plant weighs 60 tons, and when it is in working order, which will be about June 1, no fears concerning a lack of power will be felt by the rice growers of the district.

SAN FRANCISCO, CAL.—The Fall River Telephone Company, an unincorporated association, has applied to the Railroad Commission for a certificate of necessity under which to operate a telephone system in Fall River Valley, Shasta county. The company has 66 miles of telephone line and gives servcie to Fall River Mills, Glenburn, Kayton, Dana, McArthur and Pittville. It also connects with what is known as the Bass line at Fall River Mills and with the Snell line at Pittville.

SAN FRANCISCO, CAL.—The Ojai Power Company has applied to the Railroad Commission for authority to increase its rates, claiming that its present charges are insufficient to meet the costs of power. The company says that up to the present time the increased cost of producing and distributing power has been borne by its stockholders without complaint but they do not feel willing or able to carry recent increases. The company buys its power from the Southern California Edison Company and is therefore affected by the surcharge of 27% the Edison Company has been authorized to collect.

SAN FRANCISCO, CAL.—The Coast Valleys Gas and Electric Company wants to increase its charges for electricity sold in Salinas, Monterey, Pacific Grove, King City, and a number of smaller communities in Monterey county. The company buys its energy from the Sierra and San Francisco Power Company which is now operated under lease by the Pacific Gas and Electric Company, generating but a small percentage by means of steam plants located at Monterey, Salinas and King City. The company says that since its present rates were fixed by the Commission it has been forced to meet additional costs of materials and labor.

SAN FRANCISCO, CAL.—Two forms of bids have been received by the Board of Public Works for new construction on the Hetch-Hetchy project. The cost plus form, which for the first time in this city was introduced in the calls for the bids, was competed for by the Construction Company of North America, builders of the Twin Peaks tunnel. The Construction Company cost plus bid was $7,802,952, including a fee of $1,190,329. The Storrie bid was $8,951,980, including a fee of $1,074,285. The City Engineer's office, in a preliminary analysis of the cost plus bids, found that the Construction Company's bid was $1,149,028 lower than the Storrie bid.

NEVADA CITY, CAL.—Ribbons of fire will soon extend from the San Francisco Bay region far into the mountains of northeastern California, according to electrical engineers. New inventions in insulation, it is stated, will make it practicable to increase the lond of power wires from less than 100,000 volts to 220,000 volts, with the result that the wires and probably the steel supporting towers will gleam brightly at night. These high power wires are first to be used in connection with the great hydroelectric project of the Pacific Gas & Electric Company in the Pit river region of Lassen, Modoc and Shasta counties and will convey electrical energy upwards of 400 miles.

OROVILLE, CAL.—Grizzly valley, Plumas county, on the Middle Fork of the Feather river, will be transposed into one of the largest water impounding reservoirs in Superior California from which farmers of the Sacramento valley will be able to obtain irrigation water. This is according to information received here from officials in charge of the project who passed through Oroville. According to representatives of the Middle Feather River Development Company, a New York syndicate which is promoting the project, the dam is to impound 72,000 acre-feet of water. Of this portion Butte county farmers will be guaranteed 45,000 acre-feet, if they see fit to purchase it from the company.

THE PACIFIC SOUTHWEST

PHOENIX, ARIZ.—All bids were rejected for the completion of the Lyman Dam, and bids are to be submitted again by the Lyman Water Company.

TOMBSTONE, ARIZ.—Farmers of San Pedro Valley are preparing petitions to be submitted to the Board of Supervisors asking for the creation of an irrigation district.

LOS ANGELES, CAL.—Plans are under way to call a bond election at an early date to vote on a $2,500,000 water bond issue, for construction of several large reservoir projects.

LONG BEACH, CAL.—A special line, to serve Long Beach's industrial needs, and to extend direct from the harbor district to Dominguez Junction, will be built at once by the Pacific Electric Company.

LOS ANGELES, CAL.—Application has been made by the Electric Street Railway for a franchise granting the right to construct a double track electric street railroad upon Western Avenue from Melrose to Santa Monica Boulevard.

PASADENA, CAL.—A solid granite expose dam 40 ft. wide at the base, 350 ft. wide at the top and 325 ft. high in Pacoima Canyon is planned, as announced by Storm Drainage Engineer John H. Reagan. The dam will have a dranage area of 20 square miles, or 18,000 acres.

PASADENA, CAL.—The city of Pasadena has reopened negotiations with the Southern California Edison Company for the purchase of the company's light and power plant in Pasadena. Should the deal go through, the Edison plant would be merged with the Pasadena municipal light and power system.

LOS ANGELES, CAL.—It is rumored that a movement is under way for the removal of the Pacific Electric tracks from Hill, Sixth and Main streets, and the boring of a tunnel to Flower on Figueroa, from the new terminal to be erected at the present Hill Street site. The Main Street tracks could be eliminated by rerouting Pasadena lines, etc.

SAN DIEGO, CAL.—An order issued by the Railroad Commission today authorizes the San Diego Consolidated Gas and Electric Company to issue $500,000 of its 7 per cent preferred stock and common stock or additional preferred stock of the par value of $55,800. The money obtained from the sale of the stock is to be used to defray construction expenses.

PRESCOTT, ARIZ.—The firm of Robert Connell, Jr., Electric Shop and the Vyne Bros. Electric Company have merged their interests, forming one of the largest electricical merchandising and contracting concerns in the state of Arizona. Through the past twelve years the four members of this firm have worked together in the electrical industry, with Frank Wright years ago, and later with the Arizona Power Company and the Prescott Gas and Electric Company.

PEORIA, ARIZ.—An event which will be of far-reaching and tremendous importance to the section of Agua Fria occurred when electricity from the Water Users' Association transmission lines was turned on the lines recently constructed west of the Agua Fria. There are many acres of land in that section that could not be handled successfully with engines which will now be included in the productive area of the valley.

BLYTHE, CAL.—Two million dollars are to be expended in the installation of an irrigation system, flood protection, and a railroad line, to bring into cultivation 10,000 acres of the cream of the Cibola valley, across the Colorado river in Arizona, 30 miles south of here. An intake has been selected and a river crossing where a railroad bridge will be built over the Colorado was surveyed. The property is to be developed into a mammoth Pima cotton plantation.

THE INTER-MOUNTAIN DISTRICT

CHALLIS, IDA.—Challis Light & Power Company has been incorporated by W. W. Adamson at $50,000, $14,500 of which has been subscribed.

CHINOOK, MONT.—Representatives of the Montana Power Company have been discussing with local business men and the authorities the proposition of extending the Great Falls power lien from Havre to Chinook.

DENVER, COLO.—The "open shop" has been endorsed by the Denver section of the American Institute of Electrical Engineers. Resolutions similar to those adopted by the directors of the Civic and Commercial Association, the Rotary and Kiawanis Clubs, were adopted by the electrical engineers on motion of J. C. Lawler.

EUREKA, UTAH.—Arrangements have been made for the immediate resumption of development operations on the mining property of the Tintic-Davis Company of the North Tintic district. Some time ago the company installed machinery and made connection with the lines of the Utah Power & Light Company for electric service.

TWIN FALLS, IDA.—Twin Falls is to have a group lighting system in the business district. Contract for the installation of the lights has just been approved by the city council. The system will cost $16,200 and will include 108 lamp posts of the Arcadian style. Four lights will be installed at the railroad station grounds, and the remainder will be placed along Main Avenue and Shoshone Street and the court house and city park grounds.

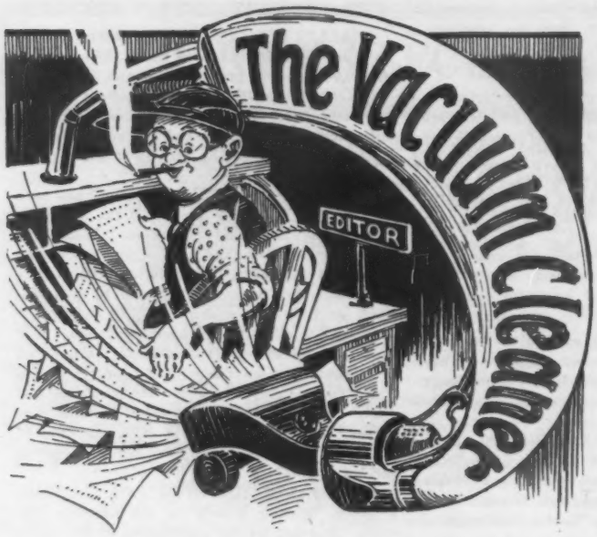
PROVO, UTAH.—The Phoenix Utility Company has resumed work on the replacement of the Utah Power & Light Company's flume in Provo Canyon. The contractors began the work about three years ago and had done a considerable amount of work on the flume and were prepared with material and men to finish the work. The war, however, closed them down. They are said to have a large force of men and will rush the work to its completion.

LOGAN, UTAH.—A lighting system of intense brilliancy has just been installed on the Agricultural College campus, the grounds on which the main buildings stand. It also makes the college hill unusually conspicuous at night, as the lights can be seen all over Cache county. Fifteen large lamp posts with the wire cables which transmit the electricity running underground comprise the system. The power is supplied by the state power plant at the mouth of Logan Canyon, one mile from the campus.

DENVER, COLO.—Striking employes of the Denver Gas & Electric Light Company were addressed recently by Fred Wesley, business agent for the Building Trades Assembly. Mr. Wesley told the gathering of approximately 150 men that preparations were under way for the opening of negotiations with the company officials. W. J. Barker, general manager of the company, repeated that the company has nothing to negotiate and that the strikers either must accept the award of the State Industrial Commission or remain off their jobs.

IDAHO FALLS, IDA.—A demonstration of electrical household appliances was held during a recent week by the Utah Power & Light Company and the Star Electric Company. The purpose of the demonstration was to bring to attention the results to be gained by the use of electrically driven labor-saving devices. Several rural sections have made applications for line extensions to provide for residence service, and in order to make the average rural extension practicable it is necessary that prospective customers guarantee certain annual revenues and this can only be accomplished by the use of domestic electrical appliances.

SALT LAKE CITY, UTAH.—Western distribution of Titan storage batteries, known as "the battery with a different guarantee," has been taken over by the Western Electric Company of Salt Lake City.



The language of the business man recommends him as even more desirable than the honorable lawyer as a public executive. A Western man of the electrical industry seems to have been firmly convinced of this fact when he made the following remark:

"If a man were to give another an orange he would simply say: 'I give you this orange.' But when the transaction is intrusted to a lawyer to put in writing he adopts this form: 'I hereby give and convey to you, all and singular, my estate and interests, right, title, claim and advantages of and in said orange, together with all its rind, juice, pulp and pips, and all rights and advantages therein, with full power to bite, suck and otherwise eat the same or give the same away with or without the rind, skin, juice, pulp or pips, anything hereinbefore or hereinafter or in any other deed or deeds, instrument or instruments, of whatever nature or kind whatsoever to the contrary in anywise notwithstanding."

* * *

A public utility company is not necessarily a thing of great size even though it is most generally thought of as an affair of that sort. The following extract from a recent report of the California State Railroad Commission shows that most of us have not really understood the full capacities of a utility company, after all:

"Wilhelm and Bertha Kretschner, owners of a water plant located at 735 West 116th Street, Los Angeles, today applied to the Railroad Commission for an order increasing the rates they charge their two customers or for authority to retire from the public utility business."

A man's work inevitably affects his vocabulary, as may clearly be seen in glancing at the love poem of a certain romantic butcher boy. We publish the creation intact below:

Deer Heart, I'm in an awful **stew**,
How I'll re-**veal** my love for you?
I'm such a **mutton**-head, I fear—
I feel so **sheep**-ish when you're near,
I know it's only **cow**-ardice,
That makes these **lamb**-entations rise,
I dread a **cut**—**let** me explain;
A single **roast** would give me pain;
I should not like to get the **hooks**,
And dare not **steak** my hopes on looks.
I never **sausage** eyes as thine.
If you would **butcher** hand in mine
And **liver** 'round me every day,
We'd seek some **ham**-let far away;
We'd **meat** Life's frowns with Love's caress
And **cleaver** road to happiness.

* * *

Every man has his own theory concerning the secret of success because each one sees the process in the light of his own experience, and so we have almost as many success mottoes as successes. A few of the most striking ones are given below:

"Keep cool," says the ice.
"Take pains," says the window.
"Be up to date," says the calendar.
"Never lose your head," says the barrel.
"Make light of trouble," says the fire.
"Do a driving business," says the harness.
"Aspire to greater things," says the nutmeg.
"Stick to it," says the glue.

* * *

A certain colored minister showed how much he had profited from the experience of maintaining a congregation, raising a family and perhaps even venturing into business, when he responded thus to a request to define the word "perseverance": "Perseverance," he said, "means, firstly, to take hold; secondly, to hold on; thirdly and lastly, to nebber leave go."

* * *

One never can tell just what meaning a word may have to another, even though that word be as carefully and precisely chosen as is humanly possible. It is simply because of the incongruity of our English language that such episodes as the following occur:

Stranger—Please tell me where I will find a chiropodist.

Villager—Don't know. You see, I'm a Methodist and the folks next door are Baptists and across the street they are Episcopalians, and—

But the stranger was gone.

Echoes of Pasadena

Ideas men have gleaned at convention
Are vastly too many to mention.
One chap, as I live,
Has purchased a 'fliv,'
To take trophies home—his intention.

Now words of 'co-op' campaign mission
And several committees' decision
Float soft through the air
As he sits in his chair
And dreams the electrical vision.

And now of convention he's dreaming.
His head with ideas is just teeming.
But nevertheless,
It's not hard to guess
The mem'ries that keep that smile beaming.